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American Veterinary Medical Association

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JOURNAL

OF THE

American Veterinary Medical Association

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(Original Official Organ U. S. Vet. Med. Ass'n.)

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ON THE THRESHOLD OF A NEW YEAR

HOPE is said to spring eternal in the human breast. At the beginning of each new year in this period of depression and reconstruction we have always been buoyed by the hope that the next year would be better than the last. And so it has been, though the improvement has fallen far short of the hopes. Unmistakably, though with painful slowness, we are making our way back toward what a distinguished gentleman has termed normalcy.

Signs of better times ahead are becoming plainer. Agriculture, upon which the welfare of the veterinary profession largely depends, has made some progress toward recovery. In production 1922 was a big year, although continued low prices of farm products as compared with other commodities prevented a due measure of prosperity to the farmers. Also, for the first time in several years, the veterinary colleges in the United States and Canada show an increased enrollment of freshmen. An increase of 12 students is not large, to be sure, but it marks a turn in the tide. Other encouraging indications might be added.

So, with good reason, we continue to hope. And for the

coming year the JOURNAL extends to its readers its best wishes for their prosperity, professional advancement and personal happiness.

A CHANGE IN EDITORSHIP AND MANAGEMENT

DEFINITE ACTION was taken by the American Veterinary Medical Association at its last annual meeting toward putting into effect a change which had been under consideration and discussion for several years. The offices of Secretary of the Association and Editor and Business Manager of the JOURNAL were consolidated, and Dr. H. Preston Hoskins was elected to the combined positions. A full report of this action is contained in the proceedings published in this number. Soon after his election Dr. Hoskins assumed the duties of the secretaryship, but for reasons of business and convenience the transfer of the work relating to the JOURNAL was deferred until the first of the year.

The wisdom of the policy of which this change is a part is obvious. For several years the Association has had no fixed headquarters and the JOURNAL has led an itinerant existence, with rather frequent changes of editors. The degree of prosperity enjoyed under these conditions is probably more than could have been expected. The ideal of a permanent home and centralization of duties is commendable, and it is to be hoped that in due time the Association may be able to take the next step of establishing permanent headquarters in an office of its own.

After a tenure of three years the retiring Editor may be permitted to indulge in a few reflections. The editorial and business management of the JOURNAL, although beset with some difficulties and conducted along with the heavy duties of another official position, has been on the whole a congenial task and a pleasant experience. Efforts have been made to represent faithfully and to minister to the varied interests of the veterinary profession and at the same time to promote the advancement of the profession and the attainment of its ideals. Hearty cooperation and assistance have been received from many collaborators who have contributed valuable papers, clinical and case reports, abstracts, reviews, reports

of meetings, news items and other material. The attitude of the Presidents of the Association and of Secretary Mayo and other officers and members has been cordial and helpful. The patronage of our advertisers has been an essential factor in the financial prosperity of the JOURNAL, and has made possible a larger and better magazine than could have been provided otherwise. Printing firms have given sympathetic cooperation in making the magazine pleasing and creditable in appearance and in getting it out on time. All these collaborators, contributors and supporters are entitled to share in the credit for whatever degree of success has been attained, and to all of them our sincere thanks and appreciation are extended.

For the new Editor we bespeak a continuance of the same support and encouragement. Knowing well from experience the difficulties attending a transfer of management and office of publication, and the delay that may unavoidably ensue in the issuance of the first number under the new conditions, we ask in behalf of Dr. Hoskins the patient indulgence of the readers in case the February JOURNAL should not be received on time.

Let us continue to go forward in working together for greater things for the Association and the veterinary profession.

INTEREST AND ENTHUSIASM LARGELY DEPENDENT UPON THE ATTITUDE OF A PRESIDING OFFICER

THOSE who attend a meeting with the privilege of participating, usually join in the discussions and general proceedings in proportions to the interest they have in the subject in question, but with the inexperienced, even though he be full of enthusiasm, there is often in evidence an invisible restraining influence. The leaders and older members do not notice it, but the younger class are very susceptible to the attitude manifested by the presiding officer. He opens the assemblage according to Hoyle, and in a very scholarly manner discharges his duty preparatory toward plunging into the deep channels of the regular program.

Now, "Let's reason together," stop a moment and conscientiously reflect. How many meetings have you attended in which

only a few self-appointed members participated? Then, how many meetings have you attended where the majority took equal part and said all they had to say instead of remaining silent and furiously expressing their opinions to a small group of sympathizers, out in the lobby? All of us have witnessed these varying conditions and must agree that the former is far from being constructive. There is a reason for all of this, and a fundamental one. We can blame the members for neglecting to participate, because they certainly have an opportunity. However, let us not feel satisfied with such a frail excuse, but go deeper into the cause.

It has been well said that "timidity is the cause for the loss of a great deal of talent." Therefore we must contend with this factor and start remedial measures from the base of it. The average practitioner is seldom called upon to speak before an audience, consequently he must have a little encouragement. He is deeply interested and his brain is full of good, substantial ideas.

The writer recalls attending a large meeting not many years ago when conditions were suddenly reversed. The presiding officer, a very able man, opened the meeting in the usual manner and clearly pointed out the problems to be considered but he unconsciously spread over the gathering an atmosphere of reserve and fear which appeared to seal the majority to their seats, and was sure ultimately to overburden the presiding officer. The writer observed the effect, and immediately took the floor with a message of welcome and an appeal for closer fellowship, asking all to enter unhesitatingly into the spirit of the convention and voice their opinions whenever they felt like it. The change was phenomenal because someone had warmed the chill and offered them a welcome as we would in our home. Many men want to say something, but they are possessed with an indescribable fear which they cannot overcome. The leader can do much toward clearing the way by placing himself in their position, making it a point to encourage timid members and to see that they have a fair chance without being drowned out by the roar of those who are always conspicuous and never fail to shine at every opportunity. E. I. S.

OUR NEW EDITOR

READERS of the JOURNAL, meet Dr. H. Preston Hoskins, who assumes the editorial chair with the next issue.

Dr. Hoskins is well known to American veterinarians not only as the son of his distinguished and lamented father, Dr. W. Horace Hoskins, but also by virtue of his own professional work during the last twelve years. He is a native of Philadelphia, and after graduating from the Central High School in that city he attended the Veterinary Department of the University of Pennsylvania and received his veterinary de-

DR. H. PRESTON HOSKINS

gree in 1910. For a short time he engaged in practice with his father, then he accepted a position with the University of Minnesota as instructor and director of the hog-cholera serum plant. For the last six years he has been in the service of the well-known firm of Parke, Davis & Co., of Detroit, Mich., as veterinary pathologist on the medical research staff. He is a member and has served as secretary of a number of State veterinary medical associations and is a licensed practitioner

in the States in which he has resided. He is the author of a number of papers reporting research work.

His education and training, his wide acquaintance and his varied experience as practitioner, educator, research worker and writer give him exceptional qualifications for filling capably the duties of the combined positions of Secretary, Editor and Business Manager to which he has been called by his colleagues of the American Veterinary Medical Association.

MONTREAL, A CONVENTION CITY

MONTREAL was decided upon at the last annual convention in St. Louis as the meeting place of the next convention of the American Veterinary Medical Association. It is a city of wonderful growth and commercial importance.

The site of this city was discovered by Jacques Cartier 386 years ago and should that adventerous Frenchman come to life and visit the scene, he would be astounded at the growth of this metropolis of Canada. Samuel Champlain in 1611, when visiting the struggling hamlet, describes it as "a little spot which is as far as barques and boats can easily come up." Should this explorer now see this rapidly growing city, he would learn that although it is the farthest inland port in the world, being 1,000 miles from the sea, it is the nearest port to Europe on this side of the Atlantic, being only 2,773 miles from Liverpool, the next nearest being Boston with a distance of 2,810 miles. It is the greatest grain exporting port in the world, having in the seven months of navigation in 1921 shipped 138,000,000 bushels as compared with its nearest competitor, Galveston, with its 72,000,000 bushels. Also the grain handling and storage facilities of the port exceed those of any other port in North America, ships drawing 30 feet now coming in to the port at low tide—quite a contrast with Champlain's day.

We find among the names of those instrumental in developing this great harbor, that of John Torrance, who was a member of the Harbor Commission which made possible this splendid harbor and facilities for handling and shipping grain which comes like a flood from the rich prairie lands of Central Canada and northern United States. Our own Dr. F. Torrance is the grandson of John Torrance and he can look

with pride on the achievements of his ancestor, these wonders having really been worked out before his own eyes.

This Canadian city is an excellent convention city, has many fine hotels and our members and their friends will certainly be gratified to furnish entertainment to any and all if they should take their vacations next summer at the time of the annual convention and attend the meeting, thus combining pleasure with a highly profitable and instructive postgraduate course.

The effort made by some misguided people in California and Colorado to get anti-vivisection bills passed in those States, has met with defeat. The reports indicate that the proposed legislation was beaten in California three to one and in Colorado six to one.

Drugless healers, such as chiropractors, osteopaths, etc., are not entitled to permits for narcotics under the Harrison law, according to a ruling of a Collector of Internal Revenue in California. The collector's attitude seems to be much more consistent than that of the applicants for permits.

"The vigilance of our Bureau of Animal Industry and of the U. S. Consul at Kingston, Jamaica, has probably prevented an outbreak of foot-and-mouth disease in this country. Doubtless the Jamaica veterinarians realize by this time that it's never safe to monkey with foot-and-mouth. All of us should realize it in advance and thank our vigilant public servants who keep it out."—*National Stockman and Farmer.*

An enterprising Jap student at one of America's inland colleges, who landed here with practically no English in his vocabulary, secured a job on a farm during vacation season. He assimilated the language readily enough and soon had a workable command of words—enough to get by with; but the feminine nouns properly applicable to the various domestic animals came near proving a German Marne. One morning he came running in very great haste to the master of the house, gasping as he ran: "Please, honorable boss, come quickly—hen-pig, she have pups!"—*Everybody's Magazine.*

THE VETERINARY PROFESSION AS OBSERVED IN VARIOUS EUROPEAN COUNTRIES [1]

By A. EICHHORN, *Pearl River, New York*

DURING THE WAR and in the years following, only very meager information came to this country with regard to the activities of the veterinary profession in the various countries of Europe. It was, therefore, with the greatest of interest that the writer looked forward to a trip during the past summer to those countries in order to observe the conditions as they existed. The report of the American veterinarians who participated in the trip through European countries in 1914 in connection with the contemplated attendance at the International Veterinary Congress in London, and who had the opportunity of closely observing the veterinary institutions and other organizations pertaining to veterinary activities, contained the last exhaustive available information on the subject. The tremendous upheaval from the war, resulting in the breaking down of the economic conditions in many of the countries, and also the geographical changes occurring there, together with the difficulty of carrying out the thorough sanitary and police measures in the control of infectious diseases during the war, could not fail to have its effect upon the veterinary profession, the same as it had upon other lines.

From general information available, everyone is cognizant of the effect which the World War had on civilization, and we are now realizing that civilization has received a staggering blow from which it will not recover for many decades. Scientific activities which had the greatest momentum in the history of the countries at the time of the outbreak of the war were naturally sidetracked during the war, and due to the economic collapse in Europe there is little hope for an early recuperation along this line.

In the past we have looked upon European institutions as leaders in scientific research. We have considered some of the universities from their traditions as being great centers for learning along the various lines of professions. From observa-

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

tions made it is apparent that most of them will no longer command such an enviable reputation and will have to be content with their meager existence. I have in mind the great medical center of the University of Vienna, to which thousands of eager students flocked from every country to enjoy the teachings of the many famous men connected with the institution, which, however, now is destined to fight for its existence on account of lack of support.

The trip afforded the writer an opportunity to visit veterinary colleges and scientific laboratories for veterinary research and also inquire into the veterinary organizations in charge of all administrative matters in connection with livestock, sanitary measures, etc.

While there appeared to be no apparent changes in the veterinary schools, on close observation it was evident that no progress had been made since 1914, and as a matter of fact, in many of the veterinary colleges neglect was noticeable, which in some instances was even associated with more or less indifference on the part of the administrators.

The attendance in the colleges was practically up to the prewar level. In fact, immediately following the war there was an increase in the number of students matriculating in almost every veterinary college in Europe. This was due to the fact that the young men of matriculating age who desired to take up the veterinary profession were called to serve in the army and could enter the college only after the conclusion of the war. The present matriculation, however, appears to be again normal and is indicative of the prospects which the veterinary profession offers in Europe. This is of marked significance when compared with the very small attendance in our veterinary colleges. The veterinary profession in Europe still lures the youth as offering him an attractive profession with the possibility of a prosperous future.

The profession apparently offers a broader field there than in the United States. This would explain the confidence which the prospective student has in the profession. There is also a tendency in the curriculum of the veterinary schools to train the veterinarian for the positions which rightly belong to the veterinarian but which have been withheld from him because of lack of specialization. This refers particularly to vocations

in food and milk inspection, animal husbandry, research work, and qualifications for positions in pharmaceutical and biological laboratories.

With the possibility of training men along those different lines the veterinarian could not only obtain lucrative positions but the profession would attain a very enviable place, with its members attaining a recognition favorably comparing with that of other learned professions. It is along these lines that the veterinary schools, especially those of Germany, are striving to develop their activities, and the leaders are exerting all their efforts to prepare the students for these various fields of activity as they realize that such a trend is imperative for the welfare of the institutions as well as for the future of the profession. Thus, the departments of milk hygiene and animal husbandry are being especially well equipped to afford the student all opportunity to specialize in these lines. Very intensive instruction is given in laboratory work with the opportunity for specialization. Such tendencies have been observed in the older established veterinary schools, and no doubt the more recently created veterinary schools in the newly established countries will follow the example.

In the newly created countries veterinary schools are also being established, one in Czecho-Slovakia and another in Jugo-Slavia. I found that the respective governments will spare no effort to provide these institutions with the necessary equipment to enable them to graduate men of competence, as it is realized that an efficient veterinary organization for a country is of the utmost importance. This is a remarkable fact, since in almost every country of Europe the expenditures have to be restricted to the minimum, yet the governments do not hesitate to provide funds for any purpose which will tend to conserve and build up a livestock industry.

The veterinary colleges abroad are also engaged in providing postgraduate courses not only for the practitioners but also for veterinarians engaged in official capacities. These courses are usually of one to two weeks' duration and concentrate on one particular line of work. Thus in the past years many courses were given on abortion and sterility. Veterinarians who participate in these courses are given an intensive theoretical and practical training along these lines. They are

given advantages of clinical work and thereby at the conclusion of the course they can carry out the work in their respective localities. Such special courses would no doubt be of material advantage in this country; as they would afford a large number of veterinarians an opportunity to familiarize themselves with the work along those lines. By providing men with such knowledge they could go out into practice and carry out satisfactory work which at this time only a few specialists would undertake. Therefore, such postgraduate courses are very suitable means for training practitioners along certain definite lines.

The veterinarians in the various countries of Europe have not been affected by the depression so much as men engaged in other lines; that is, their services are in greater demand now than heretofore, which is due to the fact that the value of livestock has materially increased and also that the animal owners are realizing the advantages which result from the services of trained veterinarians. This became apparent especially in Germany, where a great number of former army veterinarians have to be taken care of, likewise those who returned to Germany from the former colonies and also from the other territories taken from Germany. They apparently all have secured a livelihood, and I have learned that the veterinarians in that country are doing comparatively well.

I failed to learn of any dissatisfaction on the part of the veterinarians that work which justly belonged to them is taken over by persons incompetent and untrained to perform it. This especially applies to the administration of biological products, which in this country is now greatly concerning the veterinarians. There was no time in Europe when biologics could be administered by laymen. It is regrettable that in this country conditions developed which enable laymen to administer even the most important and dangerous biological products. This in itself is a serious problem and should be regulated for the benefit of the veterinary profession. It seems that the veterinary organizations and the individual veterinarians could do a great deal along this line, and it may require concerted action to regulate this phase of veterinary practice. It appears incomprehensible that in outbreaks of infectious diseases laymen should be permitted to administer

dangerous products. Yet such is the case, and often disastrous results follow. Furthermore, the handling of products which may disseminate infections by untrained men is also a menace to the livestock of the country. This is fundamentally wrong and should not be tolerated.

The veterinary organization of our county, State and Federal governments has not as yet received the attention that it has in European countries. Aside from the various activities of the Bureau of Animal Industry in which veterinarians are engaged, there are only very few States where an effective veterinary organization operates. Likewise, municipalities, counties, etc., in various parts of the countries do not provide for veterinary service. Thus one can readily see that with the extension of an effective veterinary service to the many administrative bodies which should include such service, it would be possible to extend the scope of the veterinary profession very materially over what it is at this time. For the purpose of such expansions it would be, of course, very essential that our veterinary schools should adopt a curriculum to train the men along the various lines to which veterinary service should extend, and by doing so they will materially help in placing the profession on a higher level and broader activity.

Along the line of sanitary science and control of infectious diseases, very little progress has been made in the European countries since the war. No doubt all resources of the countries have been concentrated toward the prosecution of the war, and the former efficient control over some of the diseases has been carried out with more or less indifference. Hence, some of the infectious diseases which had been eradicated from some of the countries have again appeared as a result of introduction from other countries, whereas diseases which were kept in check have been on the increase and now require the closest attention to prevent further spread of these infections. Glanders is a possible exception, which, however, can not be placed in this class, inasmuch as it was very essential that during the war all measures be taken to guard against the spread of this infection to make the armies more efficient in their functions.

At the present time glanders is under control and is practically unknown in some of the countries. This must be con-

sidered a splendid achievement, especially in considering the movement of the horses during the war and the insanitary conditions under which horses were kept. It offers also convincing proof that with proper safeguards and control measures it is possible to check and eliminate certain infectious diseases. The ophthalmic mallein test together with the biological tests for the diagnosis of glanders have proven their effectiveness and these methods of diagnosis can no longer be questioned.

With regard to tuberculosis, very little progress is being made in the control of this affection. Isolated attempts in certain localities or by individuals are being made, but there is no concerted effort in any of the countries toward the control or eradication of the disease. The wide spread of the infection, together with the economic depression in the various countries, eliminates at this time any possible action along this line. In Denmark, with the splendid agricultural organizations, particularly in the dairy industry, a marked diminution has resulted, although definite signs of eradication with the present methods can not be hoped for. The only apparent uniformity existing in the different countries with regard to the control of tuberculosis consists in the elimination of clinical open cases, together with compulsory slaughter of all animals affected with tuberculosis of the udder. Tuberculin testing is carried out on a very limited scale, mostly at the request of private individuals but without any compulsory requirements of disposing of the reacting animals. In Great Britain the authorities aimed to introduce methods of controlling tuberculosis along the line of our accredited herd system, but for the time being this effort had to be abandoned on account of the lack of funds obtainable for that purpose.

During the war scabies was widely spread among the army horses, and while measures of control were carried out in the army, the disease spread to the horses owned by the civilian population. The spread of the disease has been checked by proper treatment of animals, which in some sections is still carried out in placing the animals into specially constructed cabinets and subjecting them to the sulphur dioxid gases. This treatment without a doubt has proven very effective and is one of the contributions of the war to our knowledge of treating diseases. More recently the same treatment has been ap-

plied to canker of the foot in horses with very effective results.

Infectious anemia in horses also became widely spread during the war, and now hardly any country of Europe is free from this disease. In some sections it is very prevalent, and our vague knowledge of the disease makes its control a difficult task. No method of diagnosis has as yet been developed, and positive proof of the presence of the disease can be established only by test inoculation of horses. This fact renders the control of the disease very difficult. The writer's attention was called to more recent experimental work along this line by Jaffre of Vienna, who claims that he has successfully transmitted the disease to rabbits, which develop a characteristic febrile condition and subsequently also lesions in the liver in the form of deposits of a pigment. These lesions are supposed to be characteristic of the disease. The opportunity for studying this infection was afforded to this investigator during an outbreak of the disease among the serum-producing animals of the Governmental Serological Institute of Austria. Before the disease could be controlled more than fifty horses died of the infection, which was a serious blow to this Institute, inasmuch as on account of the serious economic condition the replacement of these horses was a financial problem.

In localities infected with anthrax the control proceeds along the same lines as in this country, consisting of the ordinary sanitary measures together with the vaccination of the susceptible animals. The vaccination in the different countries consists of either the double vaccination or the simultaneous treatment with anti-anthrax serum and vaccine.

Rabies is more widely spread in Europe than it was before the war, and while muzzling laws are in effect in almost every country, and the police authorities are very strict in the enforcement of the law, neverthless, the disease is not being checked, which is no doubt due to the fact that a large number of stray dogs are permitted to run at large, and also that the muzzling law has never proven sufficiently effective to control the disease. Great interest has been manifested in the protective vaccination against rabies, but it is doubtful whether at this time any of the countries could undertake such a task.

The subject of hog cholera control is of special interest to American veterinarians, inasmuch as it is generally recognized

that hog cholera is the most important disease of swine, and many veterinarians in the United States, especially in the Corn Belt, are mainly engaged in the control of this infection.

Hog cholera is prevalent throughout Europe. Especially where hogs are raised on a large scale the disease is more extensive than in those countries where hog-raising is not an important industry. The countries in which hog cholera prevails to a great extent and is responsible for great losses are Hungary, Jugo-Slavia, Spain and Portugal. Nevertheless, in all other countries hog cholera is also being recognized as one of the principal infections of swine. The control measures adopted for the suppression of the disease vary in the different countries and are limited to compulsory reporting and prohibition of shipments of animals from the infected premises. Prophylactic vaccination has not as yet been adopted to any great extent in the various countries of Europe, although anti-hog-cholera serum has been in use in many of the countries since its discovery in the United States. Progress in the control of hog cholera by vaccination has no doubt been retarded in European countries as a result of the failure of adopting the simultaneous method of prophylactic vaccination. It is only very recently that this form of vaccination has been adopted in some of the countries and the superiority of this method over previous efforts to control the diseases with serum alone is now recognized.

Every since hog-cholera serum has been employed the general practice has been to use it in herds where the disease already existed. In such instances the serum was administered to the well and slightly affected hogs, permitting them to remain on the infected ground in order to bring them in contact with the virus during their state of passive immunity. It was assumed that the virus thus taken up would convert the passive immunity into an active form. The fact, however, that such is not always the case, and furthermore that the control of the infection is in herds where the disease has already existed, would naturally greatly diminish the effectiveness of the vaccination. With the experience gained in hog-cholera immunization in the United States, it is not at all surprising to us that the form of vaccination practiced in Europe would not give the best results.

The simultaneous vaccination as practiced in the United States is, of course, known to the authorities in Europe, but has not been adopted for the reason that some fear was entertained that the general use of the virus might be responsible for the spread of the disease and its continuous propagation. In many of the countries it is now recognized that the exception taken to the use of the virus is not well founded, inasmuch as the disease is very extensive, and besides, proper control could be exercised over the virus to be used in connection with the simultaneous vaccination. In view of the splendid results obtained with the simultaneous vaccination in the United States, this form of vaccination is now being introduced in several European countries, and inasmuch as the results obtained therefrom are so much superior to the serum-alone treatment, there is no doubt that the general adoption of the simultaneous treatment will soon be practiced in most of the countries of Europe. Heretofore in cases of outbreaks of hog cholera the animals were given the serum treatment, and since in most instances the immunity produced was only of short duration, it was necessary in many cases to repeat the vaccination in two or three months, at each time considerable losses having been sustained. Such practice is not only costly but also discouraging to the hog owners.

In one fattening establishment in Hungary with a capacity of 65,000 hogs the practice was to install the stock hogs when they weighed approximately 75 to 100 pounds. The establishment being infected with hog cholera virus, these animals contracted the disease within two or three weeks after installation. As soon as the disease appeared the animals received the serum treatment and were permitted to remain in the infected pens. Naturally the result was a considerable loss. It is known that some of the anmials still retained a certain susceptibility to the disease, and after the passive immunity had vanished and the animals were subjected to heavy exposures they developed the disease. Thus the losses in this fattening establishment from hog cholera were estimated to be annually between 20 and 25 per cent. It is remarkable that under such conditions the proprietors have not taken advantage of the simultaneous vaccination of all hogs installed there, which would practically have eliminated the losses from hog cholera.

The manufacture of hog-cholera serum has also not progressed to the degree of perfection with which this product is now being prepared in the United States. At this time the production is limited to three countries in Europe, and they have not as yet employed the more up-to-date practice in order to insure a safe, potent product. The hyperimmunization still consists in the injection of the virus subcutaneously, which has long been discarded in the United States for the more effective method of intravenous hyperimmunization. The tail bleedings are also received in open vessels, without the application of vaccum, which results in frequent coagulation of the blood on the end of the tail. The subsequent removal of the fibrin with plugs of cotton and the hitting of the tail with a stick or piece of rubber tubing is still used to facilitate the bleeding. Such conditions, of course, make it difficult to obtain a serum free from contaminations which may at times be very harmful. The number of bleedings taken from an animal are also not regulated. In some establishments after the hyperimmunization five, and in others as many as six or seven bleedings are taken, which from experience in this country and the experiments conducted by the Bureau of Animal Industry could not produce a highly potent serum. All serum used in Europe is clarified and concentrated.

Dourine also spread among the horses during the war. It is now very prevalent in countries where it never existed or from which it had been successfully eradicated. Efforts for its control now are directed toward eradication and consist of diagnosis of the infection by the complement-fixation tests. In some of the countries affected horses are subjected to treatment, for which purpose a special preparation known as Beyer 205 is being employed. Its action on the trypanosome in dourine is supposed to be the same as the action of salvarsan on the *Treponema pallidum* of syphilis. Many publications from scientific institutions and veterinary colleges report complete recoveries following the use of this product. In those localities the infected stallions are castrated and the other infected animals are sent to work in mines where there is no opportunity for utilizing them for breeding purposes.

Abortion disease in cattle is also a serious problem in the European countries. The disease is very common, causing

tremendous losses in some of the higher developed stock-raising countries. Research work is being conducted in many of the countries, but our knowledge has not been furthered recently from these sources. In the Imperial Board of Health of Germany considerable experimental work has been conducted on this disease. The results of Dr. Zeller's experiments are of particular interest, in which he failed to recover organisms of *Bacillus abortus* from the feces, urine, etc., of animals six weeks after the injection of large doses of living cultures. The results of the experiments to control the disease with live organisms as conducted by the same institution are well known, as they have received considerable publicity in America. The findings are noteworthy, inasmuch as the experiments have been conducted on a sufficiently large scale to justify dependable conclusions. The following is a summary of these investigations:

1. Dead organisms. Both in nonpregnant and pregnant cows some degree of immunity is produced. It is, however, of low degree and of short duration. For example, many cows did not abort at the first calving after this method of treatment, but did so at the second.
2. Dead organisms plus serum. Similar conclusions to those of dead organisms alone.
3. Living organisms. Better results in all circumstances than with dead organisms. Of 128 cows so treated which had previously aborted, and were therefore definitely infected, only 6 aborted afterwards. Better results were also obtained in preventing abortion in cows which had not previously aborted but were in contact.
4. Living organisms plus serum. In the case of nonpregnant cows the results were as for living organisms alone. This method was also proved useful for the prevention of abortion in pregnant cows; in fact, this method caused as great a reduction in abortion among pregnant cows as did living organisms alone among the nonpregnant ones.
5. Controls (plain broth). Among the animals not inoculated there was an increase in the number of abortions from 175 to 245.

The opinion seems to prevail that in the infectious form of abortion 90 to 95 per cent of the outbreaks are due to the *Bacillus abortus* of Bang. The significance of the bull in the transmission of the disease is given minor or no importance.

During the trip through Germany the writer had the opportunity to see cattle which were shipped from Texas to Germany as a donation from some philanthropic sources. These cattle were sent for the purpose of providing breeding stock for milk-producing animals, and therefore were not supposed to be slaughtered for food purposes. The first shipment arrived in

Bremen during March, 1921. They were quarantined with the view of ascertaining whether they were affected with piroplasmosis. The transmission tests on the first injection proved positive and there was no difficulty in proving the infection in the cattle shipped to Germany. Anaplasmosis was also found, which was successfully transmitted by the Ixodes ticks which are common in Germany. After determination of the piroplasmosis in the cattle the Department of Agriculture in Washington was advised by cable of this occurrence, and in reply the authorities at Washington suggested that there are probably no ticks in Germany which would transmit the Texas fever parasite. As a matter of fact the transmission experiments with *Ixodes ricinus*, the most common tick in Germany, failed. In one instance, however, anaplasmosis was transmitted by these ticks from the American cattle. Some of the American cattle died from Texas fever. It is regrettable that prior to the shipment of these cattle measures were not taken to determine their condition so far as their infection with piroplasmosis was concerned, especially so as these animals were supposed to be used for breeding stock.

Contagious pleuropneumonia in cattle has also given great concern to many of the countries where the disease has not existed for many years, due to the introduction of the infection during the war. The problem of guarding the noninfected territories from the infection has given the veterinary authorities a great deal of concern. Because of the insidious nature of the disease and the difficulty in diagnosis, it has been difficult to guard against the spread of the infection. At the same time laboratories have undertaken experiments in order to devise practical means of diagnosing the disease, and it is to the credit of the laboratories of the German Imperial Board of Health that they have developed a method whereby diagnosis with the aid of a biological test has been made possible. They have succeeded in developing a medium in which a more concentrated growth of the virus is obtained. In the cultivation of the virus they have found that the reaction of the medium is of the greatest importance. The medium consists of ordinary bouillon plus 8 per cent horse serum to possess 7.8 to 8.0 pH reaction. They found that the virus has a great affinity for alkalinity. With this increased growth in the medium they

succeeded in preparing a product along the same line as tuberculin is prepared. Subcutaneous injection of this product induces a thermic reaction in cattle affected with pleuropneumonia. Postinjection temperatures are taken every two hours, the first temperature two hours after the injection. The practical results from these tests have proven very encouraging and reliable, so much so that the laboratories are now furnishing to the Czecho-Slovakian Government the product for testing all animals imported into that country. In this manner they hope to eliminate the introduction of animals affected with the disease, which without such a test would be almost impossible unless long periods of quarantine were enforced. The virus in the concentration cultivated in the laboratories referred to is also suitable for the preparation of an antigen which has been very successfully used in the complement-fixation tests for the diagnosis of this disease.

The most significant achievements, however, in recent years must be considered beyond a doubt the results in the efforts made to cultivate the foot-and-mouth disease virus. The credit for this is due to Professor Titze of the Imperial Board of Health Laboratories. Foot-and-mouth disease has been very extensive all over Europe in the past few years and only recently showed a tendency toward diminishing. In many of the affected countries considerable research has been done in attempts to shed more light on this very serious infection. Only recently Great Britain has provided a battleship for the study of the disease, which has been equipped with the most up-to-date apparatus for research, and very competent trained men were provided to take up this work. Unfortunately they have failed in accomplishing anything definite or in adding to our knowledge on the nature of the disease. On the other hand, in the German laboratories Titze has apparently now succeeded in cultivating the virus, which accomplishment will no doubt have a great bearing on the control of the disease. He succeeded in cultivating the virus in culture tubes up to the one hundred and sixty-fourth generation and in proving the virulence of this virus up to the forty-first generation on guinea-pigs. Furthermore, immunizing experiments with this virus have also been successful, and the fact that the cultures may be utilized as an antigen in biological tests is also a substantiating factor of its successful cultivation.

Another interesting feature in the research with this disease proved to be the propagation of the virus in guinea-pigs. I have personally observed guinea-pigs in which the virus has been propagated for 122 generations. Heretofore we have thought that it was impossible to transmit the disease to guinea-pigs, whereas now it has been found that it can be transmitted regularly by scarifying the pads on the feet and then applying the virus. In 24 hours typical vesicles developed on the feet of these guinea-pigs, so much so that the disease can be recognized at the first glance. The disease also frequently develops in the mouth of the infected pigs. This experimental work unfortunately can not be carried out now on so large a scale as would be desirable, on account of lack of funds, it being impossible to purchase the necessary number of large animals desirable for the work.

Just a few words with regard to the livestock situation of Europe. There is undoubtedly less livestock in Europe at this time than prior to the war, although rapid strides are being made in many of the countries toward increasing the livestock to its highest level. The depletion of livestock is most noticeable in the central and eastern countries of Europe, and not only is there a decrease in the livestock but also the quality has suffered. In Germany, Austria, Hungary, Czecho-Slovakia and Rumania they have considerably less livestock than prior to the war, and the countries which were compelled to deliver livestock to the victorious nations suffered a considerable depletion of their choice breeding stock. As a result it will require many years to stock up these countries again with higher grade animals. In some of these countries, particularly Rumania and Jugo-Slavia, this may not be accomplished for generations to come, inasmuch as the large estates have been cut up and sold to the peasantry. These farmers will not be in a position to improve their livestock because of the lack of capital and also lack of understanding of the advantages of better breeding stock. The governments also are not able to give material help to the small farmers for some time to come on account of the economic upheaval existing in many of the countries. Thus it is apparent that not only the livestock industry but agriculture in general will not advance for years to come in many of the European countries. This only sub-

stantiates the views of some of the greatest economists that in consequence of the conditions in many of the countries in Europe the United States will experience agriculturally a long era of the greatest prosperity in its history.

Since agriculture and the livestock industry go hand in hand with veterinary activity, we should look forward to a bright and prosperous future for the veterinary profession. Furthermore, the United States, being now the only country not materially affected by the ravages of the war, should be in a position to carry out extensive and intensive research work along the line of veterinary problems. The European countries are now realizing that the leadership in many of the scientific activities is passing from their side to this side of the Atlantic. We should take advantage of this opportunity and carry on the work in the right spirit and with a full knowledge of our responsibility.

VETERINARY GRADUATES

The total number of men graduated from accredited veterinary colleges in the United States during the last 15 years is as follows:

Year	*Number of graduates*
1908	469
1909	569
1910	748
1911	806
1912	735
1913	644
1914	684
1915	698
1916	734
1917	774
1918	867
1919	214
1920	375
1921	267
1922	153

THE VETERINARIAN IN POULTRY PRACTICE

By BERNARD A. GALLAGHER
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THE MOVEMENT within the veterinary profession toward a broadening of its activities to cover all of our domesticated animals is a welcome development of the past decade. Whether this expansion is due to natural evolution, economic causes, higher education, increasing demand from livestock owners, or a combination of circumstances, its effect has been most beneficial to both the profession and the livestock industry. That the domesticated birds are not being slighted in this movement is shown by the increased attention given to poultry diseases by veterinary colleges, State experiment stations and other institutions, by the number of articles on the subject carried by the journals, by addresses at veterinary meetings, and by the constantly increasing number of inquiries coming from practitioners who seek aid in the diagnosis and control of disease outbreaks which they are called upon to treat.

The census report of 1920 shows that 473,301,959 chickens were raised on farms in the United States in 1919. The value of these and the eggs produced was $1,047,323,170. In addition approximately 25,000,000 of other kinds of poultry were produced. It is not difficult to see that an industry of such magnitude holds possibilities for the veterinarian which he should be prepared to cultivate. While the value of an individual fowl is comparatively small, the tendency of infectious diseases to destroy a large portion of the flock or cause a decrease in egg production makes the total monetary loss a considerable item, and often means failure to the man who is making poultry raising a business. It is quite apparent to those in touch with the situation that diseases of various kinds are extremely common in domesticated birds, and that the losses sustained are very great.

The demand for Bureau of Animal Industry bulletins on poultry diseases and a heavy correspondence show that owners of fowls are as a rule anxious for help in their difficulties, and they would no doubt gladly avail themselves of the services of the veterinarian were they aware that he included poultry in his

practice. The veterinarian on the ground is in a more favorable position to render effective assistance than is one at a distance who attempts to diagnose a disease from inadequate information received by letter from a layman. Such information too frequently consists of a simple statement to the effect that the fowls are sick or dying and that a remedy is desired. In other instances symptoms are given which are common to several diseases or merely indicate that the birds are sick. However, in many cases distinctive symptoms, history of outbreak, age of fowls, rate of mortality and autopsy findings are detailed, and these point the way to a definite diagnosis. By familiarizing himself with the more important diseases of the domesticated birds and showing an interest in the flocks of his clients, the practitioner can not only broaden his practice but also render a distinct service to his community.

Until recent years there was no extensive demand for professional attention for diseased flocks, owing to the low value of chickens in the past, the indifference of veterinarians toward poultry practice, and the failure of the layman to realize that, like other animals, fowls are subject to a considerable number of infectious and parasitic diseases. Even with authorities on poultry husbandry the tendency has been to attribute abnormal conditions and deaths to faulty feeding or management, except in cases that showed outward pronounced lesions, as in roup or chickenpox, or where the mortality was high enough to suggest cholera. It is safe to say that among barnyard fowls that run at large the customary method of feeding or variety of the feed has practically no bearing on the incidence of disease, provided that the materials ingested do not harbor disease-producing organisms or bacterial toxins or ptomains. Also among birds in large flocks with limited range there is but a remote possibility of disease being due to dietetic causes, since it is customary to give the fowls grain, green feed, animal matter and inorganic material, which contain all the elements necessary to the nutritive requirements of the animal body.

These statements do not apply to those purely organic conditions seen in young chicks closely confined and fed exclusively on feeds which are deficient in inorganic salts, proteins or vitamins or to older confined fowls which receive a limited diet rich in starch. It is a well-established fact that birds placed on a diet of corn meal or polished rice alone, for instance, will de-

velop a condition known as polyneuritis, as a result of malnutrition. This, however, seldom occurs in the customary feeding of poultry, except in the case of brooder chicks closely confined.

Among the more important diseases of fowls are bacillary white diarrhea of chicks, roup, chicken pox, tuberculosis, coccidiosis, cholera-like diseases, cholera, fowl typhoid, and blackhead of turkeys. There are a large number of other disorders, but they do not affect a large number of birds as a rule and usually are not attended with high mortality.

The determination of the specific nature of the disease from symptoms exhibited is in some cases quite difficult or impossible. Diseases of a septicemic nature are especially difficult of differentiation, since sick birds present much the same general appearance. There is droopiness, listlessness, roughing of feathers, and general weakness manifested frequently by weakness in the legs.

From a practical standpoint an exact diagnosis is not of supreme importance in some of the diseases, as the method of handling the outbreak would be the same whether the disease were cholera, typhoid or one of the septicemias of a similar type. In those diseases for which specific treatment is available and where special ways of control are necessary it is, of course, important that the specific nature of the trouble be discovered.

The rapidity with which successive fowls become affected, duration of symptoms and degree of mortality may serve as an aid in determining the disease, at least as to whether it is an acute septicemic disease, a less acute disease such as coccidiosis, or a chronic disease such as tuberculosis. For a definite diagnosis a postmortem examination will usually be found necessary, and even this may not always reveal the exact cause. A laboratory examination is frequently required for a specific diagnosis.

Of course there are conditions which are readily determined by external symptoms, such as roup, chickenpox, scaly leg, favus, depluming scabies, and others of minor importance. Other external symptoms serve as guides in placing the trouble in a certain class of diseases. For instance, a pale comb would suggest tuberculosis, coccidiosis, leukemia or fowl typhoid, while a congested or dark-colored comb would indicate cholera or the cholera-like septicemias, pneumonia, enterititis, or blackhead of turkeys. Swelling of the joints and lameness would suggest

tuberculosis or gout. Emaciation is observed in tuberculosis, visceral gout, aspergillosis, internal tumors, anemia or leukemia. Convulsions might indicate poisoning. Death of a large number of fowls in a short time with no previous signs of disease would point strongly to poisoning by bacterial toxins, ptomains or mineral poisons. Diarrhea is present in so many conditions that it does not have a very great diagnostic value. However, bloody droppings may be present in coccidiosis of baby chicks. In cholera the droppings are of a bright yellow or bright green. They may show varying shades of yellow or green in other diseases. A postmortem examination can readily be made in chicken disease outbreaks, and where the more characteristic lesions of the various diseases are known a sufficient insight into the nature of the disorder may be gained to point the way to a method of control.

There are usually enough lesions available on postmortem examination for the determination of the more important diseases. Tuberculosis is quite easily recognized by the nodules on the liver, spleen, intestines, and often on other organs or parts. It might be confused with tumors of various types. However, in tuberculosis nodules there will be found yellowish cheesy centers or points, while in tumors the cut surface will be homogeneous or show degenerated hemorrhagic areas. Chickens affected with coccidiosis exhibit enlarged ceca containing a necrotic exudate. In enterohepatitis of turkeys there are yellowish or greenish areas on the liver, and enlarged ceca with necrotic contents. Aspergillosis is indicated when greenish or necrotic areas are found in the air sacs and lungs. In fowl typhoid and leukemia the liver and spleen are usually greatly enlarged and filled with necrotic spots. There is generally an absence of inflammation in the intestine. In cholera and the cholera-like septicemias the mucous membrane of the first portion of the intestine is inflamed and there are frequently minute whitish spots on the liver and punctiform hemorrhages on the heart. In *Bacillus pullorum* infection in hens the ovary contains hard, angular, discolored ova. Enteritis is common in birds and may be associated with a septicemic disease or may be nonspecific. In the latter case no general outbreak of disease in the flock would be in evidence. Pneumonia does not occur extensively in the flock, and is easily recognized on postmortem examination.

The course, lesions and results of disease in birds naturally

correspond with those observed in other animals, but present some variations. Birds as a rule do not show any marked resistance to the more infectious diseases to which they are susceptible, as a large percentage or practically the entire flock may become infected upon exposure. Their ability to recover from a virulent disease is also limited, and the mortality is usually high. They are, however, highly resistant to many infections which attack other animals, such as the pyogenic organisms, anthrax, tetanus, etc. Fowls often may be severely affected with a disease without disclosing noticeable symptoms as shown by the frequent death on the roost from septicemias, coccidiosis and other diseases, when the birds were apparently in good health and feeding as usual on the previous evening.

Purulent exudates are seldom observed in birds. Instead of pus, necrotic and cheesy formations are developed. These are especially apparent in the exudative diseases of the head, tuberculosis, enterohepatitis and coccidiosis. There is a marked tendency in birds to increase greatly the leucocyte content of the blood in infectious diseases, especially in some of the septicemias.

Fowls show considerable tolerance to drugs or substances of a toxic nature. From the results of experiments which were carried out by the writer with a large number of preparations it appears that in general grown fowls have approximately the same susceptibility to the toxic substances as have medium-sized dogs. They are more resistant than dogs to substances such as calomel, strychnin and tartar emetic, and less resistant to carbolic acid, salicylic acid and potassium cyanid. It was also shown that fowls are not visibly affected by drinking solutions of bichlorid of mercury 1-6,000, carbolic acid 1-1,000, permanganate of potash 1-500, or crude catechu 1-500 substituted for drinking water for periods of eighteen to twenty-one days. In connection with these experiments it was interesting to note that the crop not only serves as a reservoir for food, but that absorption through its wall is very rapid, symptoms appearing in from two to five minutes after the administration of such substances as ammonium chlorid in solution, potassium cyanid and strychnin sulphate. All doses in the experiment were given when the crop contained a normal amount of food.

The control of disease in poultry presents problems of a somewhat different character from those encountered in the control of disease in other domesticated animals. This is due to several

causes. Because of the close association of fowls in flocks an infectious disease which gains entrance to the premises is likely to spread rapidly and affect many birds by the time symptoms become apparent to the owner. Also fowls seem to show less resistance to their natural diseases than do other animals to theirs, and the percentage of affected ones which recover in severe outbreaks is less than is the case in outbreaks of disease among larger animals. It is obvious that the same care of nursing that is part of the routine procedure in dealing with other animals can not well be given to fowls. The value of the average fowl does not warrant the time consumed and the cost of treating each one separately, hence individual treatment is not practicable in cases where a large number of birds are affected. In so far as possible, therefore, measures must be adopted which will do the greatest good through treating the flock as a whole.

In mass treatment the feed and drinking water are utilized to a large extent as a means for administering medicine, and it is fortunate for the success of this method that fowls are not very critical in their taste, otherwise treatment would be very difficult. In controlling outbreaks of infectious diseases the first effort should be to separate the sick from the well as soon as symptoms become apparent. The ideal method is to remove the birds not showing symptoms to new quarters, but of course this is usually not practicable; and then, too, since all in the flock are more or less exposed, and many may have the disease in the incubation stage, a series of removals might be required. The best way to combat an outbreak is to destroy the first birds which show symptoms. If the poultry owner attempts to treat such birds there is great danger of carrying infection from the sick to the healthy in handling or feeding. Where the outbreak is established, however, a line of treatment should be undertaken when possible. With some diseases, especially those of a septicemic nature, such as cholera and the cholera-like diseases, fowl typhoid, tuberculosis, aspergillosis, and blackhead of turkeys, treatment of affected birds is of little value, and prevention by separation of the sick, and hygienic measures, including disinfection, must be depended on to keep infection as low as possible.

Preventive measures include daily removal of the droppings from the houses, and frequent disinfection with such disinfectant as 5 per cent carbolic acid, 2 per cent compound cresol

solution or 10 per cent formaldehyde solution. The use of permanganate of potash in the drinking water tends to prevent the spread of infection by means of the water and is generally advised as an aid in prevention. It may be safely used in a 1-2,000 solution. Therefore, the general methods to be followed in handling outbreaks of infectious diseases are separation of the fowls showing symptoms, after which they may be given special treatment or be destroyed as desired; careful cleaning and thorough disinfection of the houses and all feeding and drinking vessels and other utensils, and the placing of permanganate of potash or other antiseptic in the drinking water. It is also advisable to give the entire flock a dose of Epsom salt in the proportion of ½ teaspoonful to each adult bird. The amount required may be mixed in a sufficient amount of mash for one feeding. It is best to give it in the morning, as the crop is then nearly empty.

Precautionary measures will do much to keep fowls free from disease, since infections gain entrance to the flock through the introduction of new birds from infected flocks, exposure to fowls at poultry shows, or contact with neighboring fowls which are diseased. Infection may also be carried onto the premises on the shoes of persons or feet of animals. Free flying birds are probably responsible for the spread of disease in some cases. Poultry keepers should quarantine newly procured fowls or show birds for a period of from two to four weeks in order to allow time for symptoms of any disease which may be carried to develop.

IMPROVEMENT IN REINDEER HERDS

Dr. L. J. Palmer, in charge of the Government's reindeer experiment station at Nome, Alaska, has just reported that conditions among Alaskan reindeer herds are the best this year in the history of the industry. The fawn crop has been unusually large, and favorable conditions have greatly reduced the ordinary losses. Herd owners report marked gain in size and condition of animals, and a reduction in the losses from those experienced under former methods. Reindeer introduced two years ago on Nunivak Island are doing remarkably well, with the young much larger in size than animals of the same age on the mainland.

A REVIEW OF THE BASIC LESIONS OF DISEASE AND THE IMPORTANCE OF SUCH TO THE GENERAL PRACTITIONER [1]

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IN the general practice of medicine there is somewhat of a tendency on the part of the practitioner to consider only the clinical manifestations of a disease without giving further thought to the basic or structural changes taking place. In other words, the extrinsic physical manifestations are duly considered and appreciated, but the question of just what is taking place histologically is too often ignored. This leads in many instances to erroneous ideas concerning the therapeutic measures indicated. Take, for example, a case of acute parenchymatous nephritis. The urinary and general systemic aberrations are duly noted and cognizance is taken of the meaning of such symptoms. However, that is insufficient. To understand thoroughly a case of nephritis and the rational treatment thereof one must not limit one's conception of the phenomena to the purely physical manifestations, but rather try to form a mental picture of just what is taking place in the affected kidney.

Pathology is the science of disease. To it falls among other tasks the investigations of structural changes accompanying altered function. Ziegler says: "Since the finer organizations of the different tissues vary according to the functions of them and since we are unable to conceive of vital manifestations without a material substratum, so it is also reasonable to believe that pathological manifestations must likewise be the expression of material changes in the tissues concerned."

We have learned in the subject of physiology that vital functions are performed according to laws having a structural foundation. It is therefore evident that vital phenomena differing from those considered normal must rest basically on structural changes of the tissue involved.

The importance of the subject having thus been established, it is the intention to consider briefly some of the more important tissue changes taking place during the progress of a disease.

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

The clinical manifestations grouped under the general title of symptoms are, as before stated, basically the result of retrograde changes in the involved tissues. Retrograde changes are characterized in a general way by degeneration and diminution in size, disappearance of the tissue elements, and a simultaneous lowering of the functional capacity of the involved tissue. Any extensive degeneration is accompanied by inflammation, hence to the previously mentioned process of degeneration are added those of inflammation, *i. e.*, exudation and later proliferation. The net result of such a phenomenon is the physical manifestation of the five cardinal signs, *i. e.*, rubor, tumor, calor, dolor and functio læsa. These are the basic signs of disease together with sympathetic systemic relations which may be present depending upon the extent of generalization of the condition.

The cause of retrograde changes are any of the injurious influences to which the tissues are exposed during life. Perhaps the ones of the greatest import to the general practitioner are such as are classified under infections. The etiology, however, is immaterial. The basic lesions are the same, depending only upon the severity of the injurious agent and the duration of its action.

Among the various forms of degeneration are three which are fairly constant, *i. e.*, albuminous degeneration, fatty degeneration and necrosis. Albuminous degeneration is characterized histologically by swelling and enlargement of the cellular elements, due to the formation of granules, the microchemical properties of which indicate that they are albuminous in nature. At the same time nuclear changes take place. Experimental work has made it evident that recovery is possible in albuminous degeneration. On the other hand, if the process is not checked the condition leads to fragmentation of the cell, or fatty degeneration follows and finally necrosis supervenes.

Fatty degeneration may be described as a metamorphosis of the cell in which free intracellular fat is present and indicates a physicochemical change in the cell protoplasm. Virchow believed that this fat was formed by a change of the albuminous content of the cell into fat. Others believe that the fat is brought to the cell in the normal function of general nutrition, but that due to its impaired condition it is unable to assimilate it. The source, however, is immaterial, but the presence of free fat in the cell protoplasm of cells must be regarded as patho-

logical with the exception of certain specialized cells wherein fat is normally present.

Necrosis is the death of individual cells or groups of cells. Occurring directly and rapidly it is known as direct necrosis. When occurring less progressively it is known as indirect necrosis or necrobiosis. Usually necrosis it not demonstrable histologically until after the phenomenon has occurred and sometimes not until some short time has elapsed. Histologically neocrosis finally shows itself by nuclear changes. The nucleus may shrink and stain abnormally and intensely, pyknosis; or it may break into fragments of chromatin, karyorhexis; and finally it may not stain at all but still retain its usual form, finally fading out and dissolving, karyolysis.

Any or all of these retrograde processes may be present during the progress of an acute infectious disease.

It might be of interest to review briefly the basic histological lesions present and demonstrable during the progress of some of the more common acute ailments which we are called upon to treat.

Pneumonia, defined as an acute inflammatory disease of the lungs, shows the typical inflammatory reaction and retrograde processes described above. The extent and severity of these processes depends upon, and is in direct ratio to, the severity of the injury alone. This varies with the different etiological factors. For simplicity's sake this description will be limited to the inflammatory processes following an infection with pneumococci. In the ordinary infection it is not easy to demonstrate any marked injury done to the lung tissue. The inflammatory response seems chiefly to be for the purpose of counteracting the irritation due to the presence of the organisms and their metabolic products. Some injury is done, however, for in such cases it is possible to observe lung cells in the process of karyokinesis for the purpose of replacing destroyed epithelial cells. The most noticeable and in fact the most serious feature in connection with this disease is the mechanical effect of the exudate and the depressing influence of the bacterial products upon other vital organs. The exudate is serofibrinous with a marked emigration of polymorphonuclear leucocytes. There is also as a rule more or less hemorrhage into the air vesicles. In summarizing it may be said, then, that in pneumonia the direct tissue destruction is not so marked as the inflammatory reaction, which by its phys-

ical nature is able to produce serious and distressing symptoms by virtue of interference with the oxygen supply thus caused. The secondary involvement of other organs, for instance the heart, however, is due directly to structural changes in the cells of the tissue involved. This may vary from albuminous degeneration to fatty degeneration and necrosis.

Renal deterioration or nephritis presents a set of basic histological lesions which vary according to the type of inflammation present and the severity of the process. To the primary lesions are added the concurring lesions in other organs and tissues as a result of the renal inefficiency. Histologically there are four forms of renal deterioration. They are tubular nephritis, intracapillary nephritis, vascular nephritis, and capsular glomerular nephritis. Regardless of the etiology or the type of nephritis, the following retrograde processes present themselves, the only difference being that of the particular part of the organ affected. Here, too, as in other parenchyamtous organs, we have the passing picture going through the various forms of degeneration from albuminous, fatty, colloid and amyloid to final necrosis, and the presence in the organ of all or the partly absorbed or excreted tissue débris. Concurrent with the actual primary lesions we have as a result the faulty function of the diseased organ a retention in the body complex of metabolic end products such as the purin bases, creatinin, etc., together with a dissipation of serum albumin and serum globulin in the urinary secretion. The final result, if the condition is not controlled, is a complete aberration in the vital functions of the individual and death.

Primary idiopathic diseases of the heart are usually of such a nature that they belong to the gross anatomical defects, while infectious conditions are rarely primary, and usually secondary. The histological lesions observed may be limited to the lining of the heart, or that part of the lining associated with the valves, or they may be localized in the musculature. Regardless of the location, the actual structural changes partake of a similarity, and in fact the functional aberration also produces the same end results, *i. e.*, cardiac insufficiency.

Diseases of the liver secondary to circulatory disturbances are frequently met with. Primary infectious diseases of this organ are rare, while secondary or metastatic infections or toxemias are more frequent. Histologically, we here also meet with the

various forms of cell degenerations ending either in necrosis or in restoration of the involved cells. Depending upon the severity and form of the injurious agent, various conditions may obtain. Perhaps one of the most common forms or types of hepatic retrograde process is central necrosis of the lobules. This is characterized by destruction of the hepatic cells adjoining the central lobular veins. Depending here, too, upon the severity, the condition may end in restoration of the destroyed cells by active multiplication of the remaining cells, or the lesion may remain and finally by the formation of scar tissue contract and obliterate that lobule. Occasionally a condition is met with in which, by virtue of the action over a long period of time, by a somewhat mild form of irritation, there is a slow progressive destruction of the parenchymatous tissue and a replacement with connective tissue and clinically known as hepatic sclerosis. Finally it might be also said that in certain forms of the previously mentioned central necrosis the retrograde processes are so extensive as to cause the destruction of a considerable part of the organ. Only the blood vessels, bile ducts, sinusoids and connective tissue are left. There is some regeneration of the few hepatic cells remaining and of the connective tissue; however, there is a noticeable diminution in size of the organ, which, due to the infiltration with bile pigments, takes on an intense yellow hue. This is clinically known as acute yellow atrophy.

Both idiopathic and primary infectious diseases of the nervous system are met with in practice. Structural changes in diseases of the nervous system are not different from those seen in retrograde changes of other tissue elements. Thus we observe the various common forms of degeneration and necrosis. A common phenomenon is the displacement of the nucleus to the periphery of the involved neuron, or there may be a disappearance of Nissl's granules, the so-called "tiger spots." Again there may be lesions of the peripheral nervous system manifested by degeneration of the nerve fibers, swelling of the axis cylinder, destruction of the myelin sheath and the presence of myelin, protagon, cholesterin and other lipoids.

Diseases of the gastrointestinal tract characterized clinically by diarrhea and general systemic disturbances show histological changes differing in no major respect from those seen in other diseases—the usual forms of cell degeneration ending in necrosis together with the concurrent inflammatory phenomena, exu-

dation and emigration of protective cells. At the same time there is an increased activity of the mucus-secreting cells, and in fact an increase in the number of these cells, so that it may perhaps be correct to say that one of the forms of degeneration observed in intestinal lesions is of the mucous variety. In consequence of the intestinal infection we frequently have retrograde lesions in other organs. For instance, in typhoid fever there is besides a marked picture of degeneration in the intestinal elements, a more or less severe involvement of the elements of the spleen, heart, bone marrow and skeletal muscles. Changes from mere cloudy swelling down through the various forms such as fatty, colloid or hyalin degeneration to final necrosis are seen. These are due to the toxic effect of endotoxins liberated from the bacteria after autolytic degeneration of them.

SUMMARY

From the foregoing discussion one will gather that disease is a phenomenon characterized by functional incapacity, and aberrant vital manifestations resulting basically from changes in the tissue structure, and due to an injurious agent.

One of the attributes of life with which living protoplasm is endowed is the ability of reacting to a stimulus. When such a stimulus exceeds a certain degree of intensity it becomes an irritant, and the result is tissue damage manifested histologically by structural changes and clinically by alterations in function of the particular part or parts affected. This forms the basic lesion of disease. The outcome as previously mentioned is retrograde processes and inflammation. The latter phenomenon, as we know, is a remonstrative reaction upon the part of the tissue complex against any disturbing factor which tends to harm or destroy the individual tissue elements. Inflammation is too well known a phenomenon to require a detailed description; however, in reviewing basic lesions, it is fitting to consider briefly the particular outstanding features of the condition. Primarily it is characterized by vascular changes in the form of increased blood supply to the affected part, emigration of defensive cells, exudation of fluids containing various biochemical substances, protective and reconstructive in nature, as well as nourishment for the struggling tissue elements. One of the final outcomes must necessarily obtain. Either the individual dies or the protective forces of the body gradually become victorious and the

diseased part is restored to normal, or at least repaired to such an extent that the vital functions may in a measure be resumed. There are two end results in the wake of every healing lesion. The destroyed part is either regenerated by active division of the remaining cells adjoining the lesion if regeneration is possible, or, if it is not, the gap is filled in with connective tissue and a permenant scar remains. Should this occur in one of the vital organs in which regeneration is not possible, the remaining tissue of that particular organ undergoes a compensatory hypertrophy.

It may be well to point out that the various types of basic retrograde processes are not limited to any specific disease, nor do they necessarily appear singly. As a matter of fact they are all more or less constantly in evidence during the progress of a disease. Furthermore, the degenerative processes are not limited to the tissues of the organ or organs primarily affected. Thus in pneumonia we see cloudy swelling, fatty degeneration and necrosis in the heart, liver and kidneys as well as in the lungs, although in this particular disease the primary tissue destruction is not so important as the degenerative changes in other organs.

CONCLUSION

It is of course realized that in this discussion, necessarily brief, all the phases of pathological anatomy, especially the microscopic structural changes, could not be covered in a manner which the subject deserves. However, if after due consideration of the statements made, we leave the realm of pathology and view these changes from the clinician's standpoint, we must, if at all capable of a logical appreciation of the facts obtained by demonstrations of basic histological lesions, clearly see that basic lesions being the starting point of disease, the value of an intimate acquaintance with these microscopical phenomena can not easily be overestimated.

We will further, upon the application of logical thought, clearly see that from a standpoint of specificity, as far as directly aiding the tissues in restoration of their impaired functions is concerned, we are practically helpless. We find that the removal or destruction of the injurious agents and the proper nutritional and hygienic support of the individual is the limit of our usefulness. True, proper and cautious therapeutic measures in the form of medicinal stimulation of lagging organs is helpful;

however, overmeddling may easily cause more harm than good. From the above it will be gathered that about the most useful duty we can perform in aiding a diseased organism is to aid in the control or removal of the etiological factors.

Perhaps the only really efficient agent that we possess which is truly specific in the function of controlling the causes of disease is that class which falls under the general heading of biologicals. However, when all has been said and done, we shall have to admit that in controlling a disease process or aiding the tissues in restoring their structural and functional integrity we are indeed very incompetent aids, and the greatest share of the task falls upon the tissue itself. By far the greatest sphere of usefulness which we may occupy is that of the prevention of disease by the practice of such prophylactic knowledge as we have gained by contact with our five basic sciences, anatomy, physiology, chemistry, pathology and bacteriology.

If the statements herein made may be accorded the distinction of being accepted facts, then we may reasonably assume and believe that if the general practitioner would not limit his thoughts to the vital manifestations physically apparent, and clinically termed symptoms, but go further and delve somewhat into the occult and consider analytically the basic lesions and accept them as the starting point of disease in the same manner that he accepts sclerosis as the end results, his pursuit would be truly laudable. There is no intention whatever of implying that a general practitioner should be an expert pathological technician or theorist, yet the value of sufficient knowledge of the subject to enable him to have at his command a graphic and clear understanding of just what is happening when he is called upon to attend an ailing animal, be it afflicted with an infectious or idiopathic, local or general disease, is clearly obvious. In order to obtain such knowledge practitioners should avail themselves of the innumerable opportunities of conducting autopsies on dead animals. The veterinary profession is usually fortunate in that access to such study is unlimited and, as a rule, without restriction. A clear conception of miscroscopic pathology together with careful, painstaking autopsies on dead animals will eventually result in a high degree of perfection upon the part of the practitioner, and it is only by the acquisition of this highly technical skill and knowledge that the profession can expect to command the respect of the allied professions, and be able to render the service which this age of efficiency demands.

STUDIES OF COTTONSEED POISONING

I. THE PATHOLOGICAL TISSUE CHANGES RESULTING FROM CONTINUOUS FEEDING OF COTTONSEED MEAL [1]

By S. A. GOLDBERG *and* L. A. MAYNARD

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COTTONSEED MEAL is one of the most important feeding stuffs used for farm animals, but its usefulness for this purpose is limited by the deleterious effect resulting from including too large a proportion of it in the ration, particularly with certain classes of livestock. Beef cattle when fed six pounds or more per day for three or four months become lame and develop eye trouble, frequently followed by blindness. Pigs are especially susceptible to the trouble caused by cottonseed meal, death frequently resulting in six to eight weeks from a ration containing 25 per cent of this feed. Calves have a susceptibility similar to that of pigs.

Although this so-called "cottonseed meal injury" has long been recognized as a very definite factor, the specific quality or property of the meal responsible for the trouble is not yet entirely clear. The injury has been attributed to cholin or betain or their decomposition products, to obstruction of the intestines by fibers, to decomposition products formed by micro-organisms, to dietary deficiencies, to gossypol, the phenol-like compound first isolated by Marchlewski (1),[2] and to other factors. That cottonseed meal injury is due to the toxicity of gossypol rests on the work of Withers and Carruth (2). Their explanation of the trouble seems to be the one most widely accepted at the present time. However, there is still much uncertainty as to whether gossypol is entirely responsible, and the question as to how the injury may be prevented or relieved other than by giving up the use of the meal where injury i sa possibility, particularly requires further study.

The pathology of cottonseed meal injury has been studied

[1] Presented before the Society for Experimental Biology and Medicine, Ithaca, N. Y., May 19, 1922.

[2] Numbers in parentheses following authors' names refer to list of literature at end of paper.

by numerous investigators and the literature has been well summarized by Wells and Ewing (3). Such a wide variety of symptoms and of postmortem findings have been reported as to leave one in doubt as to what are the significant pathological results of cottonseed feeding, or else to force one to conclude that a variety of causes are concerned rather than a specific toxic agent. The specific pathology involved must be of primary importance in studying the prevention or relief of cottonseed meal injury.

As experiment inaugurated by Harper and Haines, of the Department of Animal Husbandry, with the object of studying cottonseed meal injury from a nutritional standpoint furnished the opportunity for the studies here reported. A group of twelve pigs, previously inoculated against cholera, weighing from 30 to 50 pounds each, were fed on the following ration: 60 per cent corn meal, 10 per cent wheat middlings, 25 per cent cottonseed meal, 5 per cent molasses. Mineral mixture, ad libitum.

The pigs were fed on board floors and had no access to soil or green material. The gain in weight was nearly normal until about a week before death, when symptoms appeared. Nine of the pigs died during the period from the eighth to the twelfth week from the beginning of the trial. The usual symptoms observed previous to death were failure to eat, vomiting, rapid, short, shallow breathing, anemia, and a weakness of the leg muscles. Frequently a pig would show these symptoms and recover sufficiently to eat more food, whereupon the severity of the symptoms would return and death usually result. At the end of the fourteen weeks' feeding, the percentage of cottonseed meal in the ration was decreased for the three surviving pigs and mangels were added to their diet. One of these pigs was slaughtered four weeks later and the remaining two five weeks after the change of diet. These passed inspection as suitable for food.

Pig No. 1 died 55 days after the experiment was begun. Autopsy showed pale mucous membranes and a reddening of the skin along the right side of the abdomen and the neck. The condition of the animal was rather poor, with anemic, flabby musculature and edema of the intermuscular connective tissues over the sternum. The peritoneal cavity contained about 500 c.c. of a brownish yellow liquid and a little fibrin over the visceral peritoneum. The ascitic liquid gelatinized on standing. The serous surface of the small intestines was markedly congested. Most of the lymph nodes of the body were swollen and congested.

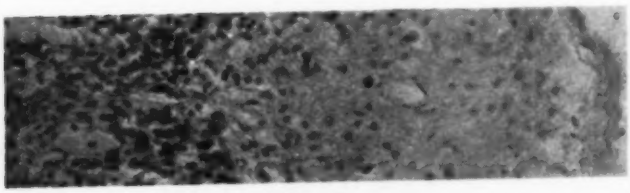


Fig. 1

Fig. 2

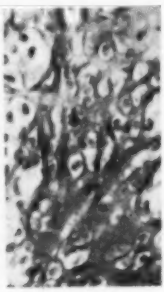
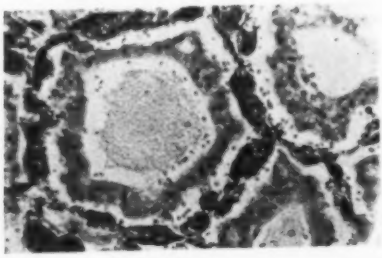


Fig. 3



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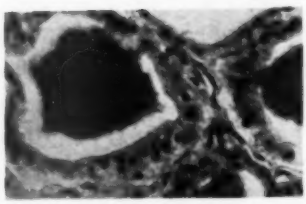

Fig. 5

Fig. 6

The gastrohepatic, bronchial and mediastinal lymph nodes were hemorrhagic.

The capsule of the spleen contained numerous petechiæ. On section a little blood oozed out; the corpuscles were swollen and congested.

The kidneys showed acute parenchymatous nephritis. The mucosa of the pelvis of each kidney was congested. The adrenals were apparently normal. The urinary bladder contained a little urine. The mucosa showed marked congestion throughout. The broad ligament was congested, otherwise the genital organs appeared normal.

The liver was swollen and the lobules apparent. On section some of the lobules were reddened, others were translucent with a clear liquid oozing out. The large veins were distended.

The stomach contained partly digested corn meal and straw. The surface of the mucosa was a peculiar yellow color, otherwise apparently normal. The small intestines contained a little bile-stained mucus, the mucosa being slightly congested. The large intestines contained dry, dark greenish material; the mucosa was slightly congested.

The thoracic cavity contained about 300 c.c. of liquid and a slight amount of coagulum. The lungs showed marked subpleural and interlobular edema affecting practically the entire lung tissue. The left cardiac, apical and part of the diaphragmatic lobes were solidified. On section the lobules were solidified and the interlobular tissue was edematous, giving the lung a mottled appearance. The rest of the lung showed individual solidified lobules and vesicular emphysema. The right lung showed changes similar to the left. On opening the bronchi a considerable amount of liquid escaped.

The myocardium was paler than normal; the coronaries were congested. The pericardial sac contained an increased amount of liquid.

DESCRIPTION OF PLATE

Fig. 1. Healing of hemorrhage. Sinus of lymph node, pig 11. ×285.

Fig. 2. Organization of subpleural edema, pig 11. ×285.

Fig. 3. Organizinz peritoneal coagulum, pig 12. ×285.

Fig. 4. Thyroid, pig 2, showing marked perifollicular hyperemia and granular material in the follicles. ×140.

Fig. 5. Normal thyroid after change of diet, pig 11. ×285.

Fig. 6. Lymphoid nodules surrounding a small bronchus, pig. 11. ×80.

The thyroid glands were swollen and congested. The larynx and pharynx were congested and contained a little of a sort of oily liquid. The bones and joints were apparently normal. The cerebral meninges were congested and edematous.

Histological examination of the lung showed interlobular and subpleural edema with a considerable amount of fibrin and a few scattered erythrocytes. The lung tissues showed hyperemia, a few scattered polymorphonuclear leucocytes and marked desquamation of the lining of the air sacs. The small bronchi contained some granular material and red corpuscles, a few lymphocytes and desquamated alveolar epithelium.

The lymph nodes showed hemorrhage in the sinuses and in the lymphoid tissue. The lymph nodules were indistinct. There was also edema and hyperemia of the lymph nodes.

The thyroids showed marked hyperemia and edema between the follicles, with a granular material in the follicles in place of the colloid substance (Fig. 4).

The myocardium showed hyperemia of the sinusoids and cloudy swelling of the muscle fibers.

The pia-arachnoid showed edema and hyperemia. In the motor cells the Nissl's granules were absent and there was some vacuolation of the cytoplasm. There was marked hyperemia of the cerebral cortex.

The liver showed marked passive hyperemia with vacuolation and cloudy swelling of the liver cells, mostly near the center of the lobules.

The kidneys showed active hyperemia and slight cloudy swelling of the convoluted tubules.

The intestinal mucosa showed slight hyperemia and some proliferation of the glandular cells.

Pig No. 2 died on the fifty-seventh day, pigs 3 and 4, on the sixty-fifth day. Three more died on the seventy-seventh day. Pig 8 died on the eighty-fifth and pig 9 died on the ninety-third day of the experiment.

The lesions were almost identical in all of the animals, with the following exceptions: Pig 8 showed solidification in the lung that appears to be of longer duration, and the presence of numerous *Strongylus paradoxus* in the smaller bronchi. Pig 9 showed pale and more firm solidification of the cardiac lobes of the lungs and marked dilatation of both ventricles of the heart.

Pigs 10, 11 and 12 had recovered after change of ration and

were fattened. Pig 10 was slaughtered four weeks after changing the diet and passed for food. Pigs 11 and 12 were similarly slaghtered for food five weeks after change of diet. They showed healed lesions in the lungs. In pig 12 there was clear liquid in the peritoneal cavity and a little coagulum. Microscopically, in this coagulum there were large numbers of endothelial cells and fibroblasts (Fig. 3). In the subpleural tissue there was evidence of previous edema with young blood vessels, fibroblasts and loose fibrous tissue (Fig. 2). A hemorrhagic lymph node showed similar evidence of healing (Fig. 1). The thyroid glands appeared normal (Fig. 5). There were numerous lymphoid nodules around the large and small bronchi (Fig. 6).

Haines attempted an experiment upon pigs with a ration containing 2 per cent of cottonseed previously treated with $CaCl_2$, which is supposed to oxydize the gossypol. He used 45 pigs divided into pens of five. The results were the same for those fed the treated as the untreated cottonseed meal. The deaths were about the same as in this experiment. The pathological tissue changes recorded were hydrothorax, edema of the lungs, congestion of the intestines, and some showed congestion of the lymph nodes. All showed foamy liquid escaping from the nostrils.

Frost and Varley attempted to produce mastitis by feeding a heavy protein diet. For this purpose a Holstein cow was fed cottonseed meal for six months, beginning with 6 quarts and gradually increasing to 10 quarts daily comprising the entire grain ration, with hay for roughage. At the end of that period she failed to show any ill effects. Two adults, a boy 5 years old and two dogs, fed milk of this cow the first week of the experiment, developed diarrhea. Two dogs fed the milk the second week did not show any ill effects.

A two-day-old calf began sucking this cow 15 days after the experiment was started. He gained weight steadily and showed no apparent ill effects. The calf was killed by bleeding from the carotid at the age of 5 weeks. Autopsy showed edema of the perirenal fat and of the omentum. In the peritoneal cavity there was about 600 c.c. of a deep amber colored liquid that gelatinized on standing, similarly to the ascitic liquid found in the pigs. All the other organs appeared normal. The meat was used for food without any ill effect.

Another calf sucked this cow for 3 weeks and 6 days and then

was slaughtered. The peritoneal cavity contained about 900 c.c. of amber colored liquid that gelatinized on standing. The omentum showed marked edema similar to the first one. The thyroids and lungs were normal.

DISCUSSION

The lesions constantly found in these pigs were ascites, edema of the perirenal fat, hydrothorax, hydropericardium, interlobular and subpleural pulmonary edema, anasarca, hyperemia and hemorrhage in the lymph nodes, hyperemia and marked diminution of colloid in the thyroid glands, and distention of the sheath of the males. That the animals die of pulmonary edema, or, as it is commonly expressed, "drown in their own serum," as a result of cottonseed poisoning has been known, but that the edema is general has not been previously demonstrated. Judging from the lesions in the calves, it seems quite possible that the ascites appears before the pulmonary edema. It is also interesting to note that the poisonous substance has apparently been transmitted through the milk of the dam. This may be of importance in regions where cottonseed plays an important part in feeding milch cows supplying milk to infants.

The ascitic liquid was of a brownish yellow color and of an oily appearance but not of an oily consistency. It gelatinized three minutes after removal, forming a peculiar opalescent streaky solidified mass surrounded by brownish yellow serum. This liquid in the calves was similar to the ascitic liquid in the pigs that died. The ascitic liquid in the pigs that recovered after change of diet was of the consistency as well as appearance of water. The slight amount of coagulum on the peritoneum contained numerous fibroblasts. This seems to show that the ascites is possibly the first to appear and the last to disappear in cottonseed meal poisoning.

The periods at which the pigs died suggests that some of them are more tolerant to the cottonseed than others. The difference in the appearance of the thyroid glands in those animals that died and those that recovered is suggestive. We hope to attempt certain experiments with a view of determining if possible the cause of the relative immunity.

The actual cause of the edema is as yet a mystery. It is possible that the effect of the poisonous material upon the myocardium is responsible for it. This seems to be strengthened by the fact that the last pig to die showed cardiac dilatation.

Some authors also state that "hypertrophy of the heart" is the lesion in cottonseed poisoning. This hypertrophy was probably a result of the obstruction to the circulation in the lungs. The condition of the thyroid glands may be the result of edema. The contention of some biochemists is that edema is due to increased acidity of the tissues. On account of this, Wells and Ewing (3) attempted to determine whether or not there is acidosis in cottonseed injury. Their results were negative.

We hope to perform some experiments with a view of solving some of the biochemic problems that suggest themselves as a result of the lesions we have encountered in these experiments. Thus far the following conclusions seem to be justifiable:

1. That the lesions in cottonseed injury are generalized edema.
2. That the initial lesion, apparently, is ascites.
3. That the poisonous substance may be transmitted through the milk.

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DOCTOR DORSET GOES ABROAD

Dr. M. Dorset, Chief of the Biochemic Division of the Bureau of Animal Industry, sailed November 18 for France and England, where he will obtain information concerning the most recent foreign investigations on the prevention of anthrax, foot-and-mouth disease, hog cholera, and other important animal diseases.

While abroad Doctor Dorset will represent the United States in an unofficial and consultative capacity at the meeting of the advisory committee on anthrax set up by the International Labor Office. The work of that committee will be to consider solely scientific and technical questions relating to the prevention of anthrax among workmen employed in wool, hair, and leather factories, and at the same time the control of anthrax in herds and flocks.

PROGRESSIVE PNEUMONIA IN SHEEP [1]

By HADLEIGH MARSH,
Montana Livestock Sanitary Board, Helena, Mont.

MANY SHEEPMEN in Montana recognize that every year they sustain a considerable loss due to the development in a certain percentage of their sheep of a condition the symptoms of which cause the affected animals to be designated as "lungers," "heavers" or "blowers." The mortality is considered to be 100 per cent, and in affected bands the annual loss averages from 2 to 10 per cent. This condition has been found by the Montana Livestock Sanitary Board to be a chronic progressive pneumonia, the cause of which has not as yet been definitely determined. At the request of several of the sheepmen of the State an investigation of this condition has been carried on, with the result that the history, occurrence, symptoms and pathology have been quite thoroughly worked out. The work on the etiology has not been completed, and therefore we have not been able to inaugurate any control measures.

The existence of this condition in sheep was first brought to the attention of the Livestock Sanitary Board in 1915, when two sheep outfits south of Fort Benton reported about 10 per cent annual loss. Field investigations were made, and early in 1916 two affected sheep were shipped to the Bureau of Animal Industry at Washington for investigation. The bureau was unable to determine the cause of the condition from these two cases, but reported that a similar pneumonia had been observed in Michigan, where the hemorrhagic septicemia bacillus had been found to be the causative organism.

During 1916 and 1917 further field investigations were made, and this condition was found to exist in a number of sheep bands in the central part of the State. In 1917 two affected sheep were sent to Dr. Kinsley, at Kansas City, for investigation, and in 1919 two sheep were shipped to the Rockefeller Institute, where Dr. Theobald Smith studied the condition. In 1919 the Livestock Sanitary Board opened its pathological laboratory at Helena, and since then pathological and bacteriological studies have been made of a number of cases of this pneumonia, and a large number

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

of field cases have been observed. At the present time experiments are being carried on in cooperation with Montana Agricultural Experiment Station in an attempt to determine the etiology of the disease.

The history of this disease in Montana leads us to the conclusion that it is a specific entity, and should be described as such. We find no mention in the available literature of such a condition in sheep, and the peculiar pathological condition found in the lungs of these sheep does not appear to have been described as occurring in any animal.

DISTRIBUTION

As to the distribution of this progressive pneumonia in sheep in Montana, it has been reported authentically from nine counties covering the middle third of the State, just east of the Continental Divide. Only one infected band has been brought to our attention on the western slope, and it was found that these sheep had been brought from east of the Divide. We do not know of the existence of this condition in the eastern third of the State, but it may occur in all parts of the State, as no survey has been made to determine definitely its extent. We have been informed that this type of pneumonia in sheep is not unknown in Utah and Wyoming, although it apparently is not mentioned in any published report.

There are many sheep outfits in the affected portion of the State that are considered free from this trouble. Others who are losing sheep at the present time say that they had no such trouble in past years. Such owners usually think that their losses began when they bought their sheep from some other section where the disease was known to exist.

From the information which we have been able to obtain from various sheep owners, it appears that this disease attacks sheep of all classes and ages, with the greatest losses among ewes over 4 years old. There is a general impression among the sheepmen that the losses from this source are confined to old ewes, but in one band, where the same ewes were kept from the time they were 2 years old until they were 7, losses occurred in about equal numbers every year.

ETIOLOGY

The cause of this pneumonia has not been determined. We are of the opinion that the disease is infectious, and two organ-

isms have been isolated quite constantly from our cases, one of which we think may prove to be the primary causative factor. As the organism primarily involved in any disease is only one factor in the etiology, we must also look for the predisposing conditions which make the individual animal susceptible to the infection. In this case these factors are also undetermined as yet. While the condition is seen most often in old ewes, there is not evidence that age is a determining factor. Poor general condition and insufficient feed do not seem to be of primary importance as predisposing factors, as considerable losses occur in small bands on the best of feed. It was thought by the sheepmen who first reported the condition to this office in 1915 that the feeding of alfalfa hay was responsible for the trouble. They said that the disease had been unknown in previous years when the sheep wintered on range and wild hay. Whether the present methods of feeding have anything to do with the occurrence of the pneumonia we do not know.

SYMPTOMS

The symptoms of progressive pneumonia of sheep develop very gradually, and it is probable that the pathological condition in the lungs begins to develop some time before clinical symptoms appear. It is first noticed that when the band is being driven these sheep lag behind and breathe heavily, especially when moving up a slope. A little later the altered respiration can be noticed when the animal is standing. The nostrils are constantly dilated and there is noticeably increased flank breathing, with acceleration of respiration. In the later stages the respiration becomes very rapid and labored, and there is mouth breathing. In most cases there is little, if any, discharge from the nostrils, and very little cough. In some cases the condition seems to be more acute, and there is a large amount of mucous exudate, causing violent coughing. As the disease progresses the animal gradually becomes emaciated, although the appetite remains good. Death finally occurs as a result of asphyxia. Temperatures have been taken on several cases, and there seems to be a slight increase in temperature, but no marked fever.

PATHOLOGY

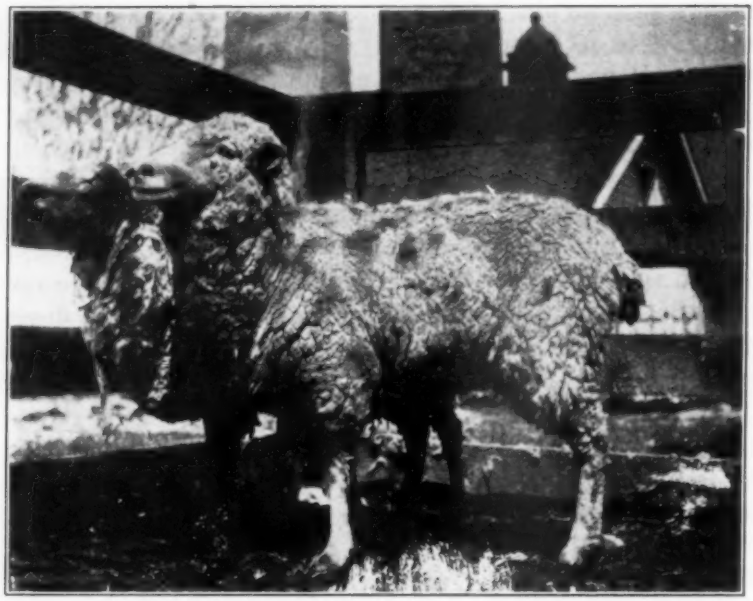
Up to this time I have made postmortem examinations on 17 cases of this disease, and in addition 5 sets of lungs have been sent to the laboratory. Our findings in these 22 cases agree with

reports on a number of autopsies made by other veterinarians in the State. The autopsies on which this description is based were made on cases which were killed artificially at different stages of the disease, except for one case in which death was due to the disease.

Descriptions of six cases have been selected as representing the different pathological conditions found in this disease. The lesions are very characteristic, and there is great similarity in general throughout the cases, but the pathological picture varies somewhat as the cases are more or less acute. The first description is that of a sheep in the last stages of the disease, detroyed and autopsied in the field, and included here because it is believed that it is typical of the majority of cases recognized in the field. The others are from records on sheep which were brought to the laboratory for observation, all of which show some points of divergence from what we consider the average case.

No. 230. A 4-year-old ewe in an advanced stage of the disease. She was greatly emaciated, and the respirations were very rapid, with very pronounced flank breathing. She was killed and a postmortem examination made immediately. The only abnormal condition, aside from emaciation, which could be found outside the thoracic cavity was the presence of a large amount of peritoneal fluid. On opening the chest wall the lungs did not collapse, but filled the entire thoracic cavity. The dorsal border was very full and round. The lungs were heavy, and felt solid on palpation. There were no nodules nor abscesses. The color was very pale, like a pale flesh color. The cut surface showed a partial consolidation throughout, with a small amount of air in part of the alveoli. The color of the cut surface was pale, with a gray effect. There were some hemorrhagic areas. The mediastinal lymph glands were enlarged and friable, and had a moist, fatty appearance. The cortex of the glands was very light colored.

Miscroscopic sections of the lung show the general picture of a chronic interstitial pneumonia. There is infiltration of small mononuclear cells into the wells of the bronchioles and alveoli and a nodular accumulation of small mononuclear cells at various points, chiefly in connection with the walls of bronchioles. There is proliferation of connective tissue in irregular strands between the alveoli. There is hemorrhage into the alveoli in some parts of the section, and a small amount of cellular and serous exudate in many alveoli. The lumen of many of the alveoli is obliterated by thickening of the walls due to cellular infiltration. There is perivascular infiltration along the course of the veins and around small vessels in connection with the walls of some of the bronchioles, giving the nodular appearance. Some of the small arteries are engorged. There is cellular and mucous exudate and hemorrhage into the lumina of some of the bronchioles.



Fif. 1.—Sheep Nos. 281 and 301. The heads are held high and the nostrils dilated

Fig. 2.—Longitudinal section of lung of Sheep 281. Shows indistinctly the coarsely granular appearance due to the solid gray lobules standing out from the cut surface.

The cellular infiltration throughout the section consists principally of small mononuclear cells, with a few polymorphonuclear leucocytes. Where there is exudate in the alveoli it consists of epithelial cells, lymphocytes and a few polymorphonuclear leucocytes and red blood cells. In some of the bronchioles there is a cellular exudate consisting of red blood cells and polymorphonuclear leucocytes.

No. 281.—This was a 4-year-old ewe received at the laboratory May 14, 1921, as a "lunger." She was in fair condition at that time, but the respiration, even when the sheep was at rest, was faster than normal, and somewhat labored. From May 16 to May 31 a record of temperature and respiration was kept. This showed a slight rise in temperature during this period, the maximum being 105. The respiration at rest increased from 120 on May 16 to 170 on May 28. On May 28, a blood count was made which showed 10,400,000 red cells and 11,400 leucocytes. The differential count showed lymphocytes 75 per cent, polymorphonuclears 23 per cent, large mononuclears 1 per cent, and eosinophiles 1 per cent. This indicates a relative increase in the lymphocytes.

This sheep was killed May 31. The postmortem examination showed no lesions outside of the thoracic cavity. The lungs lid not collapse when the chest wall was opened, but filled the whole thoracic cavity. There were extensive adhesions between the pleura and the diaphragm and thoracic wall. There were small adhesions along the dorsal border of the right lung and on the apical lobe of the right lung. The lungs had a pale, glistening, opaque appearance. The color was gray in some portions and a dull pale red in others, in contrast to the normal pink color. On section it was seen that the apical lobes and the central portions of the cardiac and diaphragmatic lobes of both lungs were consolidated. The outer portion of these lobes was partially air-containing, this portion forming a zone about 2 cm. deep. In the consolidated portion each lobule was sharply defined, appearing on the cut surface as a slightly projecting gray area about 3 mm. in diameter. This gives a coarsely granular appearance to the cut surface. At one place where the condition was apparently farthest advanced a group of lobules appeared almost white and stood out from the cut surface. In the apical lobe of the left lung there was a considerable amount of mucopurulent material in the bronchi. The mediastinal glands were large and fatty in appearance. On section they were soft and pale, the cortex being nearly white.

The microscopic sections showed a picture similar to that described for No. 230. Sections through the pleura show it to be greatly thickened. The smaller bronchi contain a cellular exudate consisting chiefly of polymorphonuclear leucocytes. In places there are, in relation with the bronchi, tubercle-like accumulations of cells consisting principally of small mononuclear cells. The lumina of the alveoli throughout this section are obliterated by an infiltration into their walls of small mononuclear cells. The capillaries are engorged with blood.

No. 290.—This was a 5-year-old ewe received June 1, 1921. At that time she was in fair condition but showed the rapid, labored

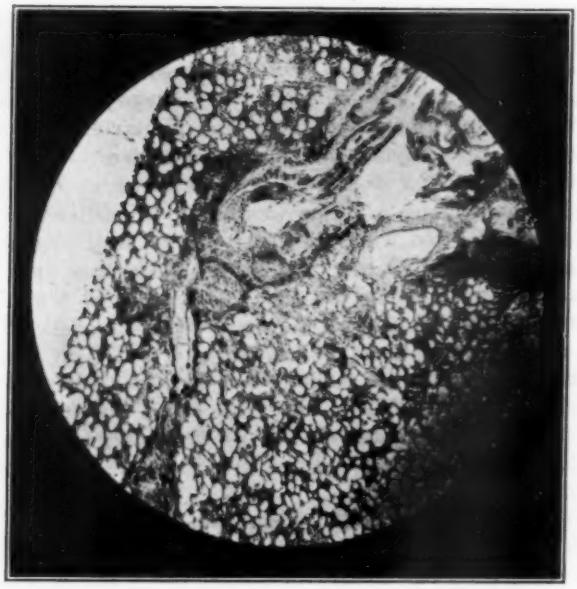


Fig. 3.—Section of lung of Sheep 186. Shows the infiltration of the alveolar walls, and the peribronchial and perivascular infiltration, with two tubercle-like accumulations of small mononuclear cells. X 15.

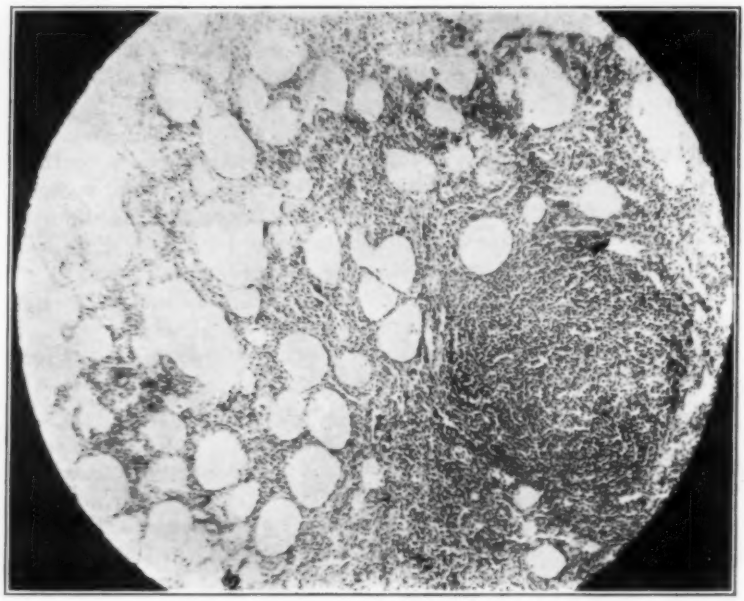


Fig. 4.—Portion of section shown in Fig. 3. X 65.

respiration of a "lunger." She died June 16, presumably as a result of the pneumonia. The temperature record showed a slight increase above normal.

On postmortem examination the principal lesions were found in the respiratory tract. The larynx and trachea were normal. The general appearance of the lungs was rather different from that usually found in a "lunger," in that the condition appeared to be more acute than usual. The color was more red than gray. The lungs did not collapse to any extent when the thoracic cavity was opened, but a large part of the diaphragmatic lobes was air-containing. This would indicate that in this case death was not due to asphyxia. The apical and cardiac lobes of both lungs were entirely consolidated. The color was mottled red and gray, the general appearance being of a dull red. The individual lobules stood out as gray areas about 3 mm. in diameter. The apical lobe of the right lung was much enlarged and lobulated. A large part of the diaphragmatic lobes was air-containing, but not normal, as it did not have the bright pink color of normal lung and did not collapse to any extent. This portion of the lung was still elastic. Along the basal borders of the diaphragmatic lobes there was partial consolidation similar to that in the apical lobes. At the posterior border of both lungs there was some involvement of the pleura, with a white, fibrous appearance and contraction of the lung tissue. There were no adhesions. The parietal pleura was normal.

The mediastinal glands were somewhat enlarged and appeared moist. They contained gas bubbles and were friable. The color was white on the surface, contrasting with the dark medullary portion. The body lymph glands were congested. The left precrural lymph gland was enlarged to a diameter of about 8 cm. and was very hard. On section it was found to consist of several old foci containing a dry, white, caseous material formed in concentric layers.

Microscopic sections from the air-containing portion of the lung show a slight infiltration of small mononuclear cells into the walls of the alveoli. There are several small tubercle-like accumulations of small mononuclear cells in relation with the arteries and bronchioles.

There is an occasional isolated giant cell. Sections from the consolidater portion of the lung presents a different picture from that found in sections of the majority of lungs examined. There is a slight thickening of the alveolar walls due to an infiltration with small mononuclear cells and also an exudate into the alveloli, consisting of small mononuclear cells and epithelial cells. The capillaries of the alveolar walls are injected. In places the alveoli contain solid plugs of cells, constisting mainly of polymorphonuclear leucocytes and small mononuclear cells. These plugs coalesce in places, forming dense accumulations of leucocytes covering an area of a number of alveoli. The centers of these foci show degeneration and necrosis. There are a number of giant cells in the alveolar plugs. The bronchioles contain a cellular exudate similar to that in the alveoli.

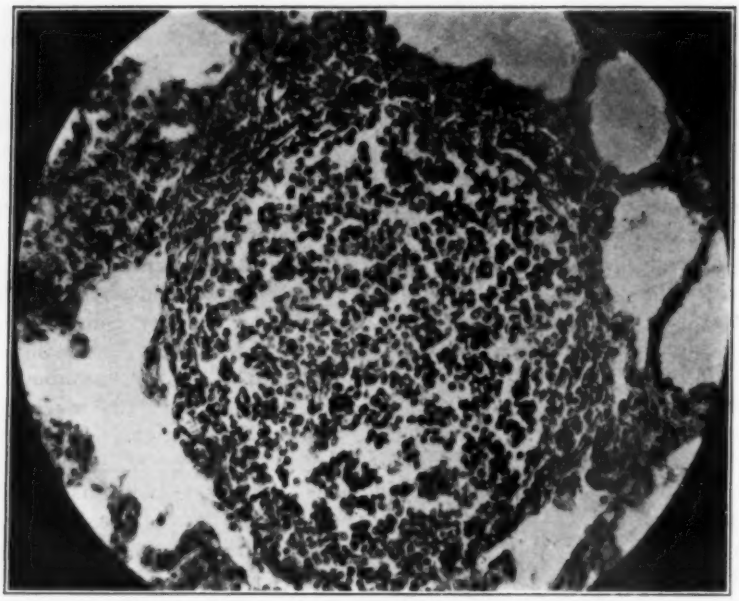


Fig. 5.—One of the tubercle-like areas. X 200.

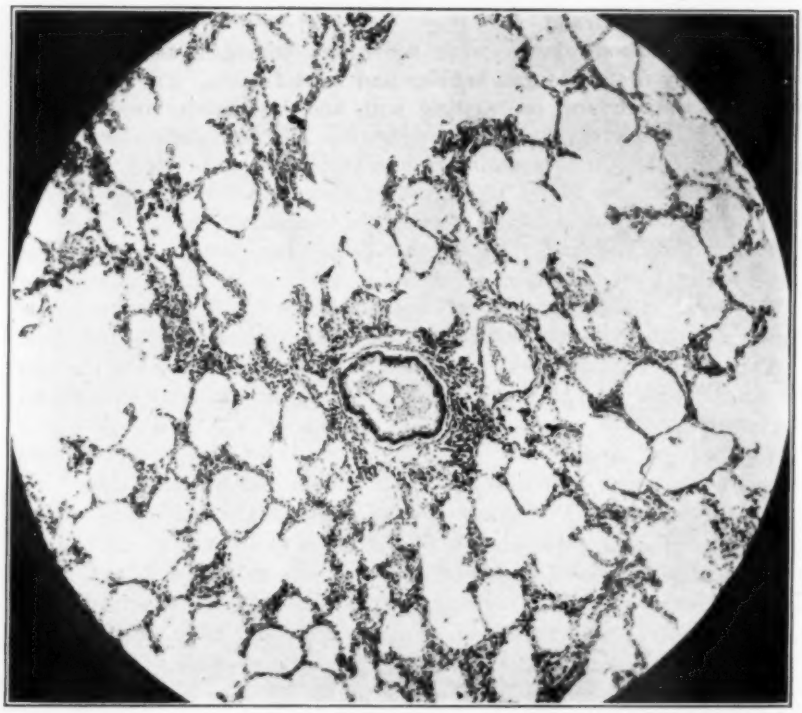


Fig. 6.—Section of slightly affected portion of lung of Sheep 290. Peribronchial and interstitial infiltration. X 70.

No. 301.—This case was a 5-year-old ewe received at the laboratory May 14, 1921. At that time she was in poor condition and the wool was taggy, but she showed only very slight symptoms of progressive pneumonia. The respiration was apparently slightly labored after exercise. Record of temperature and respiration was kept from May 16 to July 13. The temperature ran most of the time between 103 and 104, going up over 105 a few times on hot days. The respiration increased to about 100 by June 1, and from then on varied between 100 and 150. The temperature record was discontinued after July 13, and the case was now definitely considered to be one of progressive pneumonia. The progress of the condition was unusually slow in this case.

On August 2, eleven weeks after the sheep was received, although the disease had not yet approached the fatal stage, the animal was destroyed and postmortem examination made immediately. No lesions were found outside the thoracic cavity. The lungs showed a pneumonia similar to that described in the other cases. The entire lungs were involved, with patchy consolidation. The color of the consolidated patches was gray, and the partially air-containing portion was pale pink. The consolidated portions show the same coarsely granular appearance noted in the other cases. There was in this case a condition which has not been noticed in other "lunger" specimens. This was the presence of numerous small points of calcification, which appeared in some places like casts of the bronchioles. The pleura was normal. The mediastinal glands were enlarged and had a moist, fatty appearance. They were light colored, and there were some small bubbles beneath the capsule.

Microscopic sections showed peribronchial infiltration with small mononuclear cells, and infiltration of small mononuclear cells into the walls of the alveoli. There was exudate into the alveoli in some places, consisting of epithelial cells, polymorphonuclear leucocytes and small mononuclear cells. The capillaries in the alveolar walls were engorged with blood, and there was proliferation of connective tissue in the alveolar walls.

No. 310.—This case, in contrast with the last one described, developed rapidly. It was a 4-year-old wether, received at the laboratory August 10, 1921. At that time he showed no very marked respiratory disturbance. During the next ten days respiratory symptoms developed quite noticeably, and periods of severe coughing occurred, with a discharge of mucous exudate. On August 20 the sheep was destroyed, just after a violent coughing spell, and postmortem examination was made immediately. The lower portion of the trachea was found filled with a mucous exudate, which extended into the bronchi. The apical and cardiac lobes of the lungs were almost completely consolidated. The anterior and ventral portions of the diaphragmatic lobes were completely consolidated. The posterior and dorsal portions of the diaphragmatic lobes were air-containing, with some patches of consolidation. The consolidated portions were gray, in contrast with the dull pink of the air-containing portion. The individ-

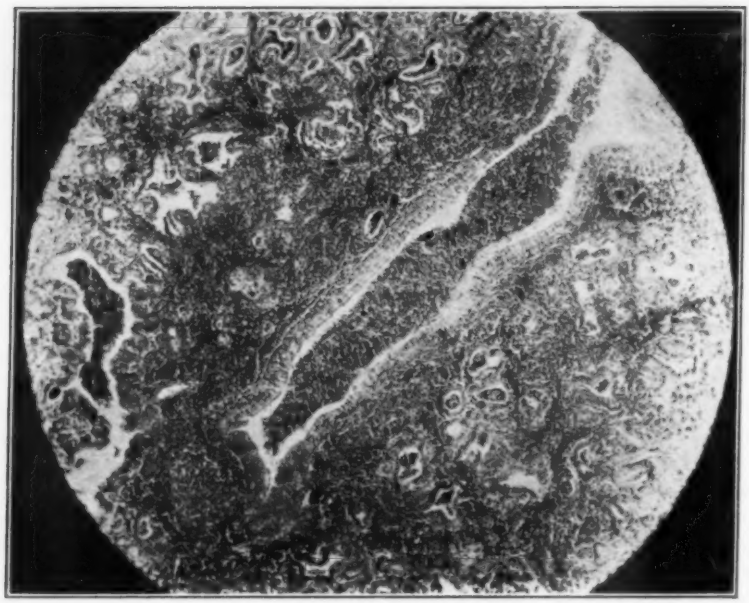


Fig. 7.—Consolidated areas in lung of Sheep 290. Peribronchial infiltration. Exudate into bronchi and alveoli. X 45.

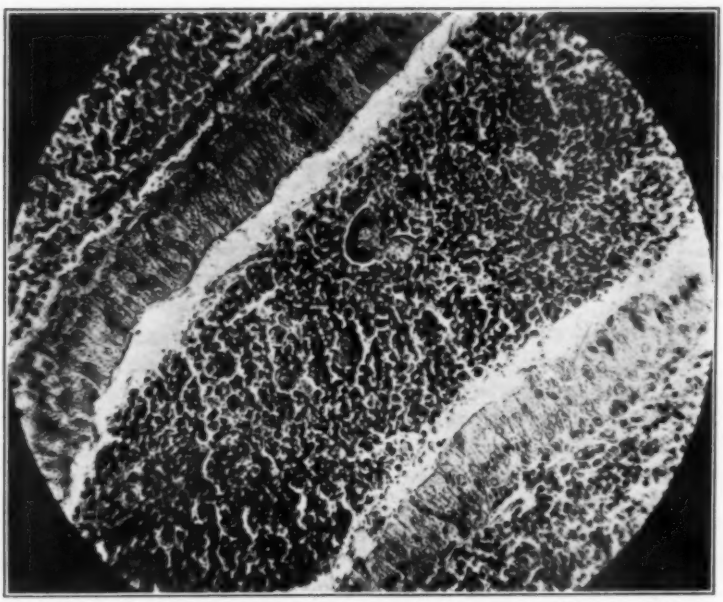


Fig. 8.—Higher magnification of bronchus shown in Fig. 7. Giant cells in exudate of polymorphonuclear leucocytes. X 200.

ual lobules of the consolidated lung were sharply defined, giving a coarsely granular appearance. The mediastinal glands were enlarged and light colored.

Microscopic section of the consolidated portions of the lung showed the appearance of a mass of bronchioles. This was evidently due to a change in the epithelium of the alveoli in this area, in which the epithelial cells have reverted to a cuboidal type. The walls of the bronchioles showed a dense infiltration with small mononuclear cells.

There was an exudate into the alveoli and bronchi, consisting mainly of polymorphonuclear leucocytes, with some small mononuclear cells and epithelial cells. In this exudate there frequently occur giant cells, and some masses of cytoplasm which show no nuclei. There was congestion of capillaries throughout the section, and some hemorrhage. There were a number of nodular accumulations of small mononuclear cells. Throughout the section there was infiltration of small mononuclear cells and a few polymorphonuclear leucocytes. The mucosa of the bronchi and bronchioles showed evidence of the secretion of a large amount of mucus. There is proliferation of connective tissue in the alveolar walls and beneath the pleura.

Sections of the air-containing portion of the lung showed extensive infiltration of the alveolar walls, which were greatly thickened, and in many places obliterated in the lumen of the alveolus. There were dense accumulations of small mononuclear cells in places, just outside the walls of the small bronchi.

No. 339.—This case was that of a sheep killed in a comparatively early stage of the disease. It was a 4-year-old ewe, received at the laboratory October 4, 1921. She was in fair condition but showed evidence of respiratory trouble. Flank breathing was more pronounced than in a normal animal and the nostrils were constantly dilated. On October 24 this animal was destroyed. She had changed very little as far as external appearance and symptoms are concerned.

On postmortem examination no lesions of any kind were found outside the thoracic cavity. When the thorax was opened the lungs were found partially collapsed and did not fill the entire cavity as they do in the far advanced cases. The general color effect was of a dull pink, rather than the gray appearance found in the advanced cases. There was partial consolidation of the lungs, particularly along the basal borders. The dorsal and posterior portions of the diaphragmatic lobes were air-containing and elastic, but were not normal. The color was dull and the consistency more firm than in a normal lung. The consolidation was complete over a considerable area along the basal borders, and the appearance here was like that in the consolidated portions in the more advanced cases. In this region the lobules were distinctly marked, each one appearing as a solid gray plug. Dorsal to this region, and in the anterior part of the diaphragmatic lobes, there were areas showing on the surface an interstitial thickening, the lobular walls appearing as gray lines. In another area the appearance on the surface was of numerous small white nodules projecting slightly. The apical and cardiac lobes did

not show any complete consolidation, but contained patches of partial consolidation. On section, part of the bronchi showed slight thickening of the walls. There was no pus in the bronchi, and no pus could be forced from the consolidated lobules. A careful examination for lungworms revealed none.

Microscopic examination of sections through a completely consolidated portion of the lung showed the characteristic histopathology as described for case No. 230. Sections made through that portion of the lung described above as showing the surface appearance of interstitial thickening, with the lobular walls appearing as gray lines, show air-containing alveoli, with patches of consolidation, and a number of tubercle-like accumulations of small mononuclear cells.

In the air-containing portion there is cellular infiltration into the alveolar walls. At one side of the section there is a large bronchus showing a great deal of mucus production in the ciliated epithelium. The capillaries in the alveolar walls are injected. Sections made through the elastic air-containing portion of the lung show all the alveoli open. In a few of them there is an exudate of epithelial cells. The capillaries of the alveolar walls are injected and there is hemorrhage into the walls. There is some infiltration of small mononuclear cells into the alveolar walls, and an increase of connective tissue fibers. There is peribronchial and perivascular infiltration with small mononuclear cells.

No. 421.—A brief description of this case is introduced because it was a case of a young ewe. This was a 2-year-old ewe which was brought to the laboratory about January 1, 1922. At that time she was in rather poor flesh and showed a somewhat accelerated rate of respiration. She was held at the laboratory until February 24, during which time she showed little change. On February 24 the ewe was destroyed and postmortem examination made immediately. The entire lungs were dull in color, but showed no areas of complete consolidation. They were elastic and air-containing throughout. The mediastinal glands showed the characteristic enlargement and fatty appearance. Sections of the lung showed the characteristic interstitial infiltration with small mononuclear cells, congestion of capillaries and hemorrhage, and tubercle-like accumulations of small mononuclear cells outside the bronchial walls.

GROSS PATHOLOGY

From the postmortem findings in the six representative cases described it will be seen that the lesions are confined to the thoracic cavity, except for slight changes in the lymph glands of other regions, and in some cases an excess of fluid in the peritoneal cavity.

The gross appearance of the lungs in an advanced case of this disease is very characteristic. When the thoracic cavity is opened the lungs do not collapse, but appear as if cast in the

mold of the chest cavity, the dorsal borders appearing very full and round. Even in those cases where a large part of the diaphragmatic lobes is air-containing, there is more rigidity than normal, due to the thickening of the walls of the alveoli. In the majority of cases there is no extensive pleuritis, although in some cases there is a more or less extensive pleuritis with adhesions. As seen before sectioning, the lungs have a pale, glistening, opaque appearance in the consolidated portions, and the color throughout is a pale flesh color, with a gray effect, in contrast to the bright pink of a normal lung.

On section it is found that a large portion of the lungs is completely or partially consolidated, particularly in the central portion, following the larger bronchi, and more in the ventral than in the dorsal portion. In nearly all the advanced cases the apical and cardiac lobes are practically completely consolidated, while the diaphragmatic lobes may show quite a large amount of air-containing lung. In some cases the consolidation is patchy, with air-containing lung between the areas of consolidation.

In the consolidated portion the color on section is a mottled gray and dull red. The small lobules are sharply defined and about 3 mm. in diameter, each standing out from the cut surface as a plug of gray material, giving a coarsely granular appearance. In one case the consolidated portion of the lung had scattered through it minute points of calcification. In some cases a mucopurulent material is found in the bronchi in the solid portion, and a similar substance can be squeezed from the lung parenchyma.

In one set of lungs which showed the typical lesions of this disease there were several abscesses exactly similar to those found in caseous lymphadenitis. This fact, together with the bacteriological findings in several cases, points to a possibility of a close relationship between these two conditions. In another case there was a much enlarged and caseous precrural lymph gland. However, as these lesions have been seen in only two sheep, it may be that the two conditions were present independently in the same animal.

The only constant pathological condition outside of the lungs has been in the bronchial and mediastinal lymph glands. In all cases they have been enlarged and somewhat friable, with a moist, fatty appearance. The color of the cortex of the glands is very light, contrasting with the dark medullary portion.

HISTOPATHOLOGY

Histologically this condition presents a very interesting study. In general it may be described as a chronic interstitial bronchopneumonia, corresponding to the acute interstitial bronchopneumonia described by MacCallum[1] in his work on the pathology of streptococcus pneumonia. In combination with this interstitial bronchopneumonia we also find in the sheep cases of lobular pneumonia, as described by MacCallum as occurring with the streptococcus bronchopneumonia.

The histological picture of course varies according to the stage of the infection, the different stages being found in the same lung, due to the progressive nature of the disease. In the typical cases the general picture is as follows: In the air-containing portions of the lung the principal change is the infiltration of the walls of the alveoli with small mononuclear cells, and a similar peribronchial and perivascular infiltration. There are at various points tubercle-like accumulations of small mononuclear cells, usually in relation with the wall of the bronchus or bronchiole. The infiltration of the alveolar walls varies in amount, it being in places so extensive that the lumina of the alveoli are completely obliterated. In this portion of the lung there is little exudate into the alveoli, although some of them contain an exudate consisting of epithelial cells and small mononuclear cells.

In the consolidated portions of the lung there is a good deal of variation in the picture presented. In the more chronic cases the consolidation seems to be due principally to an extensive interstitial infiltration with small mononuclear cells, obliterating the lumina of the alveoli, and a proliferation of connective tissue strands. The bronchi usually contain plugs of cellular exudate consisting principally of leucocytes. In some places, where the alveoli are not obliterated by the infiltration of small mononuclear cells, they are plugged with exudate consisting of epithelial cells, leucocytes and small mononuclear cells. There were found some places where the epithelial cells of a group of alveoli had changed to a cuboidal type, giving the appearance of cross sections of a mass of bronchioles.

In the more acute cases there is engorgement of the blood ves-

[1] MacCallum, W. G. The pathology of the pneumonia in the United States Army camps during the winter of 1917-1918. Monograph of the Rockefeller Institute for Medical Research, No. 10, 1919.

sels and the capillaries of the alveolar walls, with some hemorrhage into the walls of the alveoli and into the bronchioles. The cellular infiltration into the walls of the alveoli contains some large mononuclear cells and leucocytes. The alveoli and bronchi contain cellular plugs consisting mostly of leucocytes. These coalesce in places to form tubercle-like foci of pus cells, in the center of which necrosis takes place. Giant cell formation is found in the cellular exudate in these cases.

SUMMARY

In this paper we have described a chronic progressive pneumonia of sheep which has been observed in Montana for a number of years, and which causes an annual loss of from 2 to 10 per cent in infected bands. The pathological condition apparently is confined almost entirely to the lungs and the thoracic lymph glands, and there are no recognizable symptoms until the involvement of the lung is sufficient to cause labored respiration. There seems to be no systemic disturbance. The appetite remains good, and the gradual emaciation and death are apparently due to the mechanical interference with respiration.

From the study of pathological material from 22 cases of the disease we have described the condition as a chronic interstitial bronchopneumonia. The gross appearance of the lungs and bronchial and mediastinal lymph glands is characteristic. The histopathology of this pneumonia has been described as it appears in the different stages of the disease, and the condition seems to be peculiar and different in some respects from types of pneumonia which have hitherto been described.

The question of the etiology of this condition has not been discussed to any extent. We believe that it is an infectious disease, and we have done a large amount of bacteriological work with our laboratory material, with the result that we have isolated two pathogenic organisms, one or both of which may prove to be primary causative factors. We are continuing our study of the disease, and are at present carrying out bacteriological experiments on sheep in cooperation with the Montana Agricultural Experiment Station.

NEED FOR ORGANIZATION [1]

By W. E. FRINK, *Batavia, N. Y.*

WHILE it is probable that our profession would be farther advanced and our wishes would have received more recognition had we, long ago, organized for protection, this has until recently seemed unnecessary.

The New York State Veterinary Medical Society, organized over thirty years ago. had for its main object the promotion of good fellowship among the profession, and it afforded an opportunity to meet once each year, renew acquaintances, discuss interesting topics and air grievances. The Society has continued to flourish and no one can question its usefulness, although at the present time less than 50 per cent of the eligible veterinarians are members.

The need of some strong organization not only to promote our individual interests but to defend the profession against what promised to be a flank attack was realized when certain interests, for reasons rather vague, endeavored to popularize the impression that the profession was divided as to methods and policy in the matter of disease control. Luckily the word "principle" was not used, as this was the flag around which the defenders of the situation rallied, and whatever the object of the propaganda, the result was to arouse the thinking men of the profession to action; and as a result, I believe, more has been accomplished for the future of the profession than could have been done in any other way. According to Hon. B. A. Pyrke, Commissioner of Farms and Markets, this is probably the first time in history that the veterinary profession has been instrumental in shaping the State's policy. Therefore I believe that organization at the present time is a most important subject for the veterinarian's consideration.

As we look about us in all lines of human endeavor we see each important one functioning not through individuals but through representative bodies of such individuals. Even the skilled workers whose numbers run into the hundreds of thousands have their unions, through representatives of which all questions concerning the welfare of the individual are settled. How much

[1] Presented at the thirty-second annual meeting of the New York State Veterinary Medical Society, Syracuse, July 26-28, 1922.

more necessary it is for our profession, one of the fewest in numbers and possibly the least understood, to have some strong central body to represent us in questions involving our future success or failure.

The time is come when the veterinarian has more responsibilities than simply treating the individual cases as they arise in his field. His scope is more that of a consulting sanitary engineer for the breeder and livestock owner. The great interest shown and capital invested in the large breeding establishments have opened a new field, and the traffic in dairy and breeding stock incident to the foundation and maintenance of such breeding centers, and the interchange of animals necessary to the improvement of herds already established, have added a host of responsibilities particularly to the private practitioner if he is to be efficient and perform his share of the duties in the control or eradication of the diseases that menace our livestock industry.

The character of the work now demanded of the practitioner requires that he keep well informed of the new knowledge we are constantly acquiring regarding these diseases, as well as the regulations of the different State and Federal bureaus regarding segregation, quarantine and other details in the handling of the same and in the interstate movement of livestock. He is brought in contact with the officials of the different State and Federal bureaus, and the results of his efforts are no longer limited to the confines of the small territory in which he works but extend to other counties, States, and perhaps foreign countries.

The character of the work, particularly the tuberculin testing of cattle in the attempt to control and eradicate tuberculosis, naturally requires that the technique of application and interpretation of results be as uniform as possible in order to prevent later confusion in the movement and retesting of the animals. The laws and regulations of the different States should also show as much uniformity as possible for the same reason.

The amount of this work now being performed by the veterinarians scattered widely throughout our State, and the probability of a great increase in the demand for this kind of service, suggests to us that for the increase of efficiency and at the same time the protection of the individual veterinarian and the profession as a whole, an attempt should be made at this time to organize a strong central body to promote cooperation and harmony among the different groups of men carrying on this im-

portant work. Representatives of this organization could make demands, recommend and support measures, request changes in the regulations, investigate charges, and otherwise look after the welfare of the profession.

It has been publicly stated that on account of the loose methods of some of our practitioners in tuberculin testing, fifteen States have felt it necessary to enact a special quarantine on cattle from the Empire State unless accompanied by a health certificate signed by a Federal inspector. An investigation of this statement reveals the fact that it is untrue. It is true, however, that enough "loose" testing has been done by a few individuals to bring our cattle into disrepute in other States, thereby working a hardship upon and creating a serious menace to our cattle industry. Not only this, it has caused the most scathing criticism, not of the individual veterinarians who were guilty of these acts, but of the profession as a whole. It is another example of the innocent being punished with the guilty, and so far nothing has been done to establish their innocence or place the guilt where it belongs.

Cases have arisen where cattle tested by men of good standing reacted upon retest. These men have been summarily removed from the list of veterinarians approved to do this work without an opportunity to vindicate themselves. With an organization such as we suggest to take up these matters with the officials in the departments, a thorough investigation could be made, and if there were evidences of omissions or commissions on the part of the veterinarian, a recommendation to the Board of Regents that his license be revoked could be made.

If the veterinarian who might be susceptible to influence to make loose or inaccurate tests of animals or groups of animals knew that a field agent of a representative body of his brother veterinarians was liable to appear to check up his work, possibly to conduct a retest, he would be apt to give more thought to his responsibilities as a veterinarian, conduct the test in a more efficient manner, and be more reluctant to yield to the pressure of unscupulous breeders or dealers whose main desire seems to be to secure a health certificate for their animals regardless of the consequences either to themselves, the veterinarian, the cattle industry or the public.

There are in this State approximately 550 veterinarians registered by the Board of Regents. A considerable number of

these men have been given a license to practice over the protest of this Society, by amendments to the veterinary practice law and very liberal interpretations of the same. Some of these men perform their work as far as they are able in a conscientious manner, but they lack the preliminary and technical training to do credit to a profession, for they are in no sense professional men, having been granted a license as a result of circumstances rather than as a result of education and fitness.

It is possible also that some of the graduate men have failed to realize their responsibilities as professional men and have been guilty of deceit or negligence that is a discredit to our profession, and this has added to the already prevailing idea that the veterinarians of this State are not to be trusted.

Our organization could investigate the methods of the men who are accused of unfair or incompetent work, and whether they are graduates or nongraduates, members or nonmembers of this Society, should act on the principle that a profession to exist as a profession and develop as ours should, under the stimulus it should receive from the higher preliminary and more efficient technical education possessed by the newer additions to the same, as well as the increased knowledge of disease constantly being gained, thereby broadening the scope of our field of activities, make their recommendations to the proper authorities as to whether these men are a credit to the profession and interested enough in its welfare to be allowed to continue.

Again, the discoveries and new methods of handling and control of disease, as well as the discoveries of new diseases, have been worked out by an entirely different group of men than those who have been so busily engaged in developing our livestock industry. We are, therefore, in need of some means of closer contact between the veterinarian and the breeder, some practical way by which the needs of the latter may be ascertained and he at the same time be educated as to the possible assistance he might receive by making use of his veterinarian in his effort to establish and maintain a herd free from the diseases that are bound to cause him economic loss unless he approaches his problems with caution and judgment and fortifies his establishment with the sanitary and hygenic equipment necessary to the comfort and health of his animals, for without these they can never be a profitable investment.

An active field agent or secretary of an active society or associ-

ation could confer with the breeders and men interested in the welfare of our livestock, ascertain their needs, make recommendations and cooperate with them to this end. He could meet with the committees of the various breeding associations and other agricultural organizations where matters of public interest are being discussed, lend his assistance directly or indirectly in the formation of measures, and recommend changes in the regulations of the departments in control, if such changes seemed advisable, thereby assisting in the handling of the problems that are every day becoming more numerous and complex.

Among the many responsibilities of the veterinarian is one of no mean importance if we are to make the progress we should. I refer to his implied duty to the State in return for the special privileges granted him. A man licensed to practice, possess, handle and prescribe drugs, serums, etc., for which he may charge a fair profit, and to perform operations, specific tests, etc., for which he may charge and collect under the law, as well as fair fees for expert testimony in cases where his knowledge and special training make it valuable, should feel that something is due the State in return. He should at least feel it his duty to make every effort to be prepared as far as he is able to perform in a professional manner *all* the services required of him, or see that the owner is brought in contact with someone who can do so.

In some sections the practitioner has been criticized because he openly stated that he did not have time for poultry diseases or did not care to administer serum or serum and virus to hogs, or he had plenty to do without tuberculin testing. Many owners have suffered losses because of this attitude of the local veterinarian or have been obliged to seek outside assistance. These remarks have been taken up by farm bureau and other organizations and made the basis of statements that the profession did not care for such work and it would have to be done by others.. I believe the veterinarian who neglects these opportunities to serve his State is guilty of an omission, and our proposed field agent or secretary could investigate cases of this kind and attempt to impress upon the indifferent practitioner the seriousness of such an attitude to the profession and urge him to shoulder his share of the responsibilities. If he still insisted that he did not care for the work, it should be seen to that a man was placed in that locality who did care for the work and was competent to perform it.

Many of you who are practitioners have no doubt noticed the weight, sometimes amounting almost to awe, which the opinion of some veterinarian connected with the State or Federal department received when he happened to be asked to diagnose some condition or express judgment in the matter of tuberculin testing. Was it because of his greater knowledge or skill? No; it was because of his connection with such a department, giving him a reputation for superior wisdom that many times he did not possess.

With a strong organization and a unity of purpose to perform our service in a scientific and conscientious manner, our members could soon establish a reputation for skill and integrity that would be far superior to the one now uppermost in the minds of the laymen.

I can see no reason why there should be friction between the practitioner and men engaged in so-called State or Federal work. If each attended strictly to his own business they should cooperate and be the best of friends.

It has been reported that when cattle tested and condemned by local veterinarians arrived at the place of slaughter, the officials in charge of the postmortem work have enlightened and at the same time dissatisfied the owner by informing him that he had wasted his money in paying for a private test, as the State employed a corps of specialists for that very purpose. This I consider a gross breach of professional ethics, as not even a tradesman would endeavor to interfere with a competitor's interests in such a manner.

Other instances have been noted where official postmortems have been conducted in a negligent manner, this being unfair to both the veterinarian and the tuberculin test. There is at the present time no one in authority to investigate and disprove or confirm the same.

It seems to me that our present association, the New York State Veterinary Medical Society, could be made to meet the present need for organization if the interest and whole-hearted support of the profession in this State could be secured. The practitioners are the ones who should be most vitally interested in the future, and just how much state medicine is to interfere with their source of income should be one of their problems. I consider it the duty of each and every one of these men to become affiliated with their local and State associations and take

an active part in the affairs of the same, that their interest may receive some consideration when problems concerning them are being studied and solved.

Thse suggestions could become realties, we believe, through this association by the election or appointment of a field secretary or agent whose duty would be to assist in bringing about the cooperation of the veterinarian, the State and Federal departments and the livestock owners.

This may be nothing more than a dream on my part, but it seems to me that the time is come when our profession, both as individuals and as an organization, should take a more active part in the formation of the livestock sanitary laws and indirectly in matters pertaining to public health. The veterinarian is by the nature of his training and experience the one man who can intelligently advise and cooperate with those directly interested in these questions that are increasing in importance every day. We have seen numerous instances where questions involving the scientific knowledge necessary in matters of disease control have been handled by laymen with a result discouraging, if not disastrous, to the breeders, and, to say the least, not elevating to our profession. If we as an organization took a more active part in these affairs of public interest there would be less need for them to be handled by laymen and less discontent among the profession regarding the activities of county agents and others. The livestock industry needs us as willing cooperators, not as disgruntled individuals, and if we stand ready and willing to perform a service our opportunity must come.

"United we stand, divided we fall," is as applicable to our profession at this time as it was to the thirteen original colonies when they were threatened with disruption, and the same earnest "honest-to-God" effort on our part will bring about a unity of purpose, and as a result we shall take and maintain the position of responsibility and respect in the eyes of the world that our profession both by its purpose and activities honestly merits.

We must not for a moment forget that such organization is not alone for our benefit but will enable us to render more efficient service to the livestock owner, for whom the profession was evolved and to whom it is dedicated.

THE PRIVATE PRACTITIONER, THE SALT OF OUR PROFESSION [1]

By J. G. FERNEYHOUGH
State Veterinarian, Richmond, Va.

THE MAN who does things (not just the one who knows how) is the man who really develops his country and assures his followers of success. You men who spend your time and energy in actual practice are the pillars of our profession, because you are taking the risk when you carry into practice the theories of the laboratory man. It is not the inventor of a machine who is apt to be killed if it proves faulty, but the poor devil who is game enough to fly it. The surgeon in a quiet room, cooled by a fan, writes what must be cut and how it should be done. His discoveries were doubtless made when experimenting on an animal securely strapped to the operating table, with plenty of help and all necessary equipment at hand, and the animal in question merely a "subject" whose life or death concerned no one. Contrast this with a practitioner called in to save a man's valuable animal, probably in some out-of-the-way place, with no help at hand, and his practice at stake. Yes, his very living, among many other things, he must consider quickly. It takes courage combined with knowledge, skill and wisdom to make a successful veterinary practitioner, for here it is that the "tree is known by its fruit."

For these reasons it ill becomes an official veterinarian, whether he be employed by the State or the Bureau of Animal Industry or is a member of some college faculty, in any way to ignore, slight or belittle the veterinarian who gives his life's work to the practice of his profession. The State man, the bureau man and the college professor receive monthly salaries, which they know will be available; but the practitioner is the man who takes the chance. He so often tries to work out plans which must necessarily be the making of the man who first thought of them if all goes well, but the ruin of the practitioner if things go wrong. In and out of season we make the practitioner the goat—someone has to be. Then it surely behooves us in official work to recognize, and what is more, acknowledge to the profession that the

[1] Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

practitioners, as a class, are the very salt of the veterinary profession.

During the last twenty years I have devoted my time to the duties of State Veterinarian, and thus have been thrown constantly with the practicing veterinarians. I know them. I know not only what they can do, but what they have done, are doing, and, what is more, what they are going to do. I do not know about other States, but I dare say no man will be State Veterinarian of Virginia for a period of twenty years unless he does know and appreciate the practitioners of the State.

Of course the practitioner, like the official, must be a respectable and honorable man to start with, and a student of his profession. He must behave and respect himself, or others will not respect him. He must regard the confidence of his colleagues, and especially he must be absolutely honest and fair with his clients. When this has been done on his part, then it is the duty of the official veterinarian to stand up for, support and appreciate the veterinarian in daily practice. We can assist him in two ways. First, by referring stock owners to their nearest qualified veterinarian, when they come to us for advice and we know it is work for a private veterinarian to handle. In the Virginia office I keep a map dotted with red-head pins denoting the location of every veterinarian in the State. The practitioners are listed by counties as well as alphabetically, and I can advise any person at a moment's notice as to the location of his nearest veterinarian. I have occasion to do this daily. Secondly, as officials we can go before the legislature and use our influence in preventing "quacks" from obtaining special permits to practice, and thus uphold the law. I have had the honor of being Chairman of the Legislative Committee of the Virginia Veterinary Medical Association for fifteen years, and while one or more bills have been introduced at each session of the State Legislature which would permit persons to practice within this State who have not been qualified to do so, no such bill has been passed in Virginia for the last fifteen years..

In fact, we who are in official work can do much toward helping the practitioner, provided we constantly bear in mind that it is not only our duty but a privilege to strengthen the veterinary profession by supporting the work of every competent, qualified veterinarian who is practicing our profession. The man in practice is a veterinarian in the broad sense, because in the

course of time he must necessarily deal with each and every branch of the profession.

Of course you can not help an individual unless he wants help. Not only must he want it, but, what is more, he must appreciate it, and respond to the willingness of those who desire to help him succeed. In other words, it must not be one-sided, but thoroughly cooperative. This cooperative spirit must actually exist between the practitioner and the official, and then the differences will be few and far between. We all find trouble without looking for it, but in order to attain success we must constantly help others overcome the obstacles of life, for nothing makes one happier than to realize that he has actually done something to make life brighter for someone else.

DISCUSSION

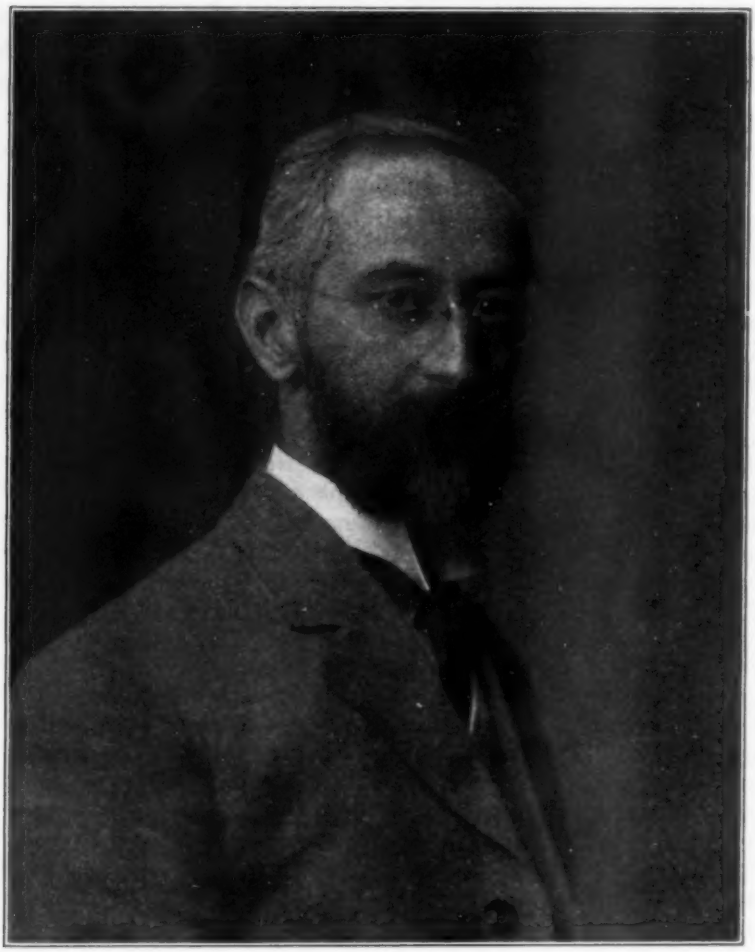
DR. FERNEYHOUGH: I find among the members present this morning a gentleman who has missed only one meeting of the A. V. M. A. in twenty years, and everybody would excuse him then for he missed that meeting to go to a horse race. That gentleman is Dr. Otto Faust. He has attended these meetings eighteen years in succession, and I want to say to you that I don't know anything that I would appreciate more if I opened the JOURNAL and saw the photograph of that gentleman, a practitioner who attended the meetings for eighteen years. When you start advertising your practitioners for what they do, then you are going to have your practitioners attend your meetings. Now, gentlemen, I tell you I believe we have got to start in after each meeting and do something to bring some practitioner to light; start with your oldest men, they will not be with you always; that is why I mentioned the modest gentleman here. You have a splendid opportunity to recognize the services of a practitioner. I don't ask you to publish any five or ten thousand pamphlets to be sent out and published in newspapers; I merely ask that the photograph of this man be placed in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, in view of the fact that for eighteen years he has never missed a single meeting of the A. V. M. A. Start that now; it is your work, and then you will go to the front.

Did you ever see a man succeed in business unless he looked out for himself? You can call to mind some public men who are always doing something for somebody else, and he will die and somebody will have to bury him, and everybody will say: "It is a pity that poor fellow didn't make a success in life."

You practitioners here must look out for yourselves. How many are here this morning? I don't blame them for not com-

ing, I didn't want them to come to hear me, but, gentlemen, how many practitioners are here this morning to hear some one say something in their behalf? I wrote to Dr. Mayo and told him that I would like to have something to say to the practitioners, and I came here, but how many practitioners are here?

You have got to have a reason for what you do, and you have got to line up. If I can do no more than start this, I do hope



DR. OTTO FAUST
Practitioner of Poughkeepsie, N. Y.,
a Worthy Son of a Noble Father

Breathes there another in our ranks with loyalty so true,
With keener sense of membership, of duty's broader view?
A worthy trait of brotherhood his faith and trust inspire.
Let us his action emulate—son of a noble sire.

(*With apologies to Sir Walter Scott.*)

you will take this seriously; I do not know of one man in your Association who has been so faithful. Put this picture in the JOURNAL as being a practitioner who has attended this meeting for twenty years, and follow it up, gentlemen, every year, with the picture of a practitioner, and you will see more interest. You have got the power, but don't let somebody flatter you and get it away from you.

I have been tied up in educational work so long that I sometimes think we are going wild over education and universities and colleges. I don't want to take from them, but I find when you talk to the best college men that they are right with us. It isn't the fault of the college man, but it is the fault of the man outside that doesn't seem to appreciate it, and I think it is the fault of you practitioners not fighting for your own. I do want to see you start at this meeting today to take some recognition of this practitioner and other practitioners who have done nothing but practice.

CHAIRMAN KINGMAN: We appreciate these kind remarks.

DR. FERNEYHOUGH: I never start a thing and lose out. I am in dead earnest about this. I would like to see some one make a motion that this photograph business be started. We have got the worthy practitioner here. I would like to see someone make a motion that Dr. Faust's photograph be published in the JOURNAL with that history of attendance. It will make others attend, I know.

DR. FERGUSON: I didn't just hear who that practitioner was who attended eighteen consecutive meetings, but I presume it is Dr. Faust. At any rate, I take pleasure in moving that his photograph be reproduced in our JOURNAL in an early issue.

(The motion was seconded and carried.)

CHAIRMAN KINGMAN: We can express our appreciation here by giving Doctor Faust a hand, since he happens to be present. (Applause.)

DR. FERGUSON: Mr. Chairman, I would, on behalf of the practitioners, express appreciation for the kindness of the doctor that spoke in behalf of the practitioner. We surely appreciate his interest in our welfare and appreciate the fact that he is with us good and strong.

DR. CALDWELL: We gave quite an ovation to a man last night. We have had just now a paper and a talk by a man who is not a practitioner, but he is defending the practitioner, and not only defending him, but he is doing as much as he can in his behalf. Therefore, I second Dr. Ferguson's motion.

CHAIRMAN KINGMAN: It has been moved and seconded that it be made a matter of record that this section wishes to make known its appreciation of the efforts of Dr. Ferneyhough on the part of the practitioner.

(The motion was carried.) (Applause.)

TUBERCULOSIS IN ITS RELATION TO THE FEEDING AND MARKETING OF LIVESTOCK [1]

By PROF. HOWARD R. SMITH

Livestock Commissioner, The National Live Stock Exchange, Chicago, Ill.

IN CONVERTING farm feeds into meat and milk products for the most profitable returns, consideration must be given to the digestible nutrients in various feeds, current market values on such feeds, and their proper blending in the ration.

Of equal importance to the feed supply is the type of the animal—one having large digestive capacity and capable of producing a product of superior quality.

Last, but not least, is the health factor. Most diseases are manifested by outward symptoms. The owner becomes concerned and seeks necessary treatment. This is not ordinarily true of tuberculosis, because the owner is, in most instances, unaware of its presence in his herd. It is the insidiousness of tuberculosis that is chiefly responsible for its great prevalence throughout this and other nations today. It is unfortunate that the tuberculosis bacillus was not discovered sooner and that steps were not taken earlier to combat it. That it is a factor which materially increases the cost of producing meat and milk can no longer be ignored.

Out of a total of 39,416,439 hogs slaughtered under Federal inspection during the fiscal year ending June 30, 1922, 5,640,081, or 14.3 per cent, were retained for tuberculosis; 70,304 or 0.18 per cent were condemned as inedible; and 95,809, or 0.24 per cent, were sterilized. Dividing the total loss at current market values on condemned pork and its by-products by the total number of pounds of hogs, including healthy as well as tuberculous hogs, slaughtered under Federal inspection during the year 1921, we find that the average loss on all hogs killed was nearly 10 cents per hundred pounds live weight. That represents the toll exacted by tuberculosis in pork production—a serious handicap to the industry and one which has been steadily increasing from year to year.

In realization of this loss, which is in large part eventually

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borne by all producers, for the packer must take into consideration the condemnation to be expected according to the law of averages, The National Live Stock Exchange at the last annual convention held in Kansas City passed resolutions urging all hog buyers to pay a bonus of 10 cents per hundred on hogs bred and fed in tuberculosis-free counties. At a meeting of the packers called by Mr. Everett C. Brown, president of The National Live Stock Exchange, these resolutions were presented and accepted by the Big Five, as well as many smaller companies in the Middle West. It was admitted by them that they could afford to pay 10 cents per hundred pounds more for hogs from a tuberculosis-free area than the average run of hogs of the same quality that come to the markets. Enough have already consented to make it seem probable that at the next meeting of the Institute of American Meat Packers, to be held in Chicago next October, it will be approved by practically all concerns. It seems to me but fair to give this recognition to the people of any county sufficiently enterprising to make appropriations for county-wide tests on all herds of breeding and dairy cattle, which, with the slaughter of the reactors, should remove the chief cause of tuberculosis in hogs.

There are now a large number of counties in the United States that are successfully eradicating tuberculosis from the herds within their boundaries. I can not refrain from taking pride in the county work being done in my home State. We have in Michigan 22 counties which have provided funds ranging from $2,500 to $15,000 each for one year's work. This money is appropriated out of county funds on the basis of approximately 25 cents per head for the breeding and dairy cattle population of the county. This is to cover operating expenses. The indemnity is paid out of State and Federal funds. While this county work has been under way less than two years, we already have seven counties that have been once tested. Hillsdale County, the first to be completed, is due for another complete test next October. Of 218 infected herds thus far retested, comprising 2,798 cattle—more than half the entire number of infected herds on first test—there were found on second test only 56 reactors, and these were confined to 35 herds. There are now not to exceed 60 infected herds representing less than 100 infected cattle in the entire county, and this number will be greatly reduced during the next six months. We expect in the near future to receive a bonus of

$10,000 per year on our hogs in Hillsdale County alone, to say nothing of the increased value on our breeding cattle.

In this connection I wish to say that the success of the Michigan work in the eradication of tuberculosis is due in large part to the attitude of our people and the fact that it is cooperative between the county government, the State and the Federal Governments. I believe greater success comes to such an enterprise when the people in the local community provide a part of the funds, preferably by county tax. The teamwork of Dr. Rich, the Federal inspector in charge, and Dr. Killham, State veterinarian, has shown what subordinating the personal credit factor for results can really accomplish in cooperative work of this character.

County-area work, which means so much to the owners of grade breeding and market stock as well as to the owners of pure-bred herds, is also moving forward with pronounced success in Missouri, Nebraska, Wisconsin, Illinois, New York, Washington, Oregon, and some of the Southern States. It is an efficient, economical and thorough system of eradicating tuberculosis which is fast bringing the support of all people in securing adequate appropriations.

Tuberculosis in steers and feeding heifers is not so large a factor in increasing the cost of production as in hogs because of the small percentage of tuberculosis among young feeding cattle, but it is an important factor in feeding cows for beef or for milk production. It is no exaggeration to state that an average of 10 per cent of the cows which come to our northern markets have tuberculosis, many of which are in such an advanced stage of the disease as to preclude the possibility of using feed to advantage. Many of these cows will remain thin, regardless of the amount of feed supplied. The removal of reactors from our dairy herds will not only prevent the further spread of tuberculosis in the herd but it will eliminate heavy losses on feed that is being wasted on cows incapacitated by tuberculosis. This is costing the Nation millions of dollars annually, probably much in excess of the losses on condemned beef and pork.

While the problem of eradicating tuberculosis is a costly one for the time being, it will prove to be one of our profitable investments. An expenditure of eight million dollars annually for five years will come near eliminating an annual loss of approximately forty million dollars caused by tuberculosis. While the

five years of work, which has really been an organization period, has not reduced as yet the condemnations on hogs in the Nation as a whole, it has reduced the number of cattle retained for tuberculosis from 2.6 per cent in 1916 to 1.9 per cent in 1922. This is very encouraging. Many of you are actively participating in this great enterprise which is being watched with keen interest by foreign nations. All can take pride in this accomplishment.

The various interests at the market centers, in full realization of the seriousness of the tuberculosis situation, have been sponsors of this campaign from its beginning. Funds have been subscribed for the employment of a livestock commissioner at each of the principal markets, to devote his entire time to the promotion of this work through educational means. The following markets are now participating: Chicago, St. Louis, Omaha, Kansas City, St. Joseph, St. Paul, Sioux City and Milwaukee, all of which work is supervised and coordinated through The National Live Stock Exchange.

If success eventually comes and the disease is reduced to a minimum, which we know now is possible, it will be the result of an efficient Government organization from Washington to the various States and counties, and a spirit of cooperation which comes from love for and loyalty to our Nation.

MACKELLAR GOES TO WASHINGTON

Dr. W. M. MacKellar, a veteran in the tick-eradication work of the Bureau of Animal Industry, has been appointed assistant chief of the Tick Eradication Division in that bureau, effective November 16. Doctor MacKellar directed the successful eradication of cattle ticks from the State of California, the work covering the period 1906 to 1916 and including an area of nearly 80,000 square miles. Upon completion of the work in that State, he was placed in charge of Federal work in Georgia, and cooperated with State officials in the eradication of cattle ticks from 80 counties. He is the author of a recent circular entitled "How to Get the Last Tick," which is used widely in States where infestation still exists.

Doctor MacKellar's appointment to the Washington office is largely a recognition of his ability as an expert in tick eradication and quarantine activities and of successful work in organizing field forces and winning cooperation of State and county officials and livestock owners.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

SARCOMATOSIS IN A COW

By R. A. RUNNELLS

Department of Animal Pathology, Michigan Agricultural College, East Lansing, Mich.

A CASE of unusual interest both from the clinical and pathological standpoints came under the observation and care of the Veterinary Division of the Michigan Agricultural College some time ago. From the clinical standpoint it was of interest because the symptoms which led to a diagnosis of traumatic pericarditis proved to be due to an unrelated and uncommon condition although involving practically the same organs. From the pathological viewpoint the case attracted interest because a condition of this nature is rare and the anatomical alterations were so marked that it was difficult to understand how the patient survived until they became so extensive.

History.—The patient was a purebred Holstein cow which three months previously began to show symptoms ordinarily manifested by cattle suffering from traumatic gastritis and pericarditis. During this period there were times when the symptoms were quite pronounced and others when they seemed partially to subside. An unfavorable prognosis was given the owner, but he decided to allow the cow to live until her period of gestation terminated, because she was a well-bred animal and considerable value was attached to her offspring. She gave birth, three weeks prematurely, to a living bull calf, and was then brought to the hospital for treatment, if deemed advisable, or for autopsy if treatment was thought of no avail. The latter was decided upon at the end of a week because the symptoms became greatly aggravated, partly due undoubtedly to the weakened condition in which the patient had been left after the parturition of the previous week.

Symptoms.—At the time of slaughter she was extremely emaciated; there was moderate edema of the brisket and abdomen;

she remained in a standing position almost constantly; the fore limbs were placed well apart with the elbows pointed outward; splashing heart sounds could not be detected; there was moderate diarrhea.

Anatomical Alterations.—A diffuse mass of what appears to be neoplastic tissue spreads over the outer surface of the reticulum where it comes in contact with the diaphragm. This mass resembles lymphoid tissue. As is not uncommonly the case, the reticulum contains several foreign objects such as tacks, nails, pins, screws and small bolts, but at one point a brass pin about 5 cm. in length has penetrated the reticular wall for a distance of about 2 cm., but still lacks about 1 cm. of reaching the outer surface, due to a marked thickening of the wall and the presence of the neoplastic tissue at this point.

A considerable quantity of ascitic fluid is present in the abdominal cavity.

The liver is unevenly colored. Light yellowish brown irregularly shaped areas varying from a pin point to a centimeter in diameter alternate with relatively small areas or bands dark reddish brown in color. The lighter areas are quite uniformly distributed throughout the organ. No other marked alterations are observed in the abdominal cavity.

In the thorax is a large quantity of fluid similar to that observed in the abdominal cavity. The heart is much larger than normal and shaped more like a large ball than a cone. (After having stood in 10 per cent formalin solution for several weeks it measured 45 cm. from the base to the apex, and the circumference at the coronary groove was 95 cm. The organ was not weighed.) The pericardium is adherent to the epicardium in most places. Upon opening the heart from the base to the apex the cut surface presents two distinct layers, the inner consisting of heart muscle and the outer apparently of neoplastic tissue. The inner heart muscle layer appears as a relatively narrow band, normal in color but considerably thinner than the normal myocardium. This is more conspicuous in examining thin sections made from the base to the apex. In places the myocardium of the right ventricle is only 8 mm. in thickness and the left ventricle 4 cm., while the outer neoplastic layer presents a rather constant thickness of 8 to 10 cm. over the entire outer heart surface. There is a sharp line of demarcation between the two layers and apparently no infiltration

of the myocardium by the neoplasm. In sections made from the base to the apex the inner reddish brown layer and the outer pale gray layer present a marked contrast. The latter consists of whorls of light gray areas which seem to emanate from the heart muscle and are interspersed with and separated by darker bands of tissue which are firmer in consistency and have the appearance of having developed with more regularity. That is, these bands appear to consist of fibers running parallel to one another in contrast to the whorls of less dense and apparently less organized tissue. The neoplasm appears to have its origin in the epicardial connective tissue. As stated before, the pericardium is adherent to the epicardium in most places, though it can be separated at others.

In the accompanying illustration the myocardium of the ven-

Small round cell sarcoma.
Heart of cow.

tricles appears much thicker than is indicated above, but it will be noted that the heart was sectioned close to the interventricular septum, which was apparently not involved.

Histopathology.—Portions of the neoplastic tissue from both the heart and reticulum and portions of the liver were fixed in Zenker's fluid, imbedded in paraffin, sectioned, and stained by

Mallory's eosin and methylene blue method. In addition portions of the liver were fixed in osmic acid.

Sections from the heart and reticulum show the tissue to be richly cellular. The cells forming the mass of the tissue are about 2 to 4 times as large as red blood cells, round or nearly round in shape; their nuclei are large, staining deep blue on account of the dense arrangement of the fine chromatin granules. Cytoplasm surrounding the nuclei is not discernible. The intercellular stroma of fibrous connective tissue is not abundant except in an occasional area where it is much increased in amount and appears to be rapidly proliferating. In these areas the small round cells are massed in clumps or nests. Most fields shows numerous newly formed capillaries. The structure of this neoplastic tissue places it with the sarcomas of the small round cell type with slight alveolar arrangement.

In sections of the liver the usual radial arrangement of the cords of liver cells is not observed. The parenchymatous cells for the most part appear as large, clear vacuoles, with or without nuclei. Where present the nuclei are pushed to one side, giving the cell a signet ring appearance. Some nuclei stain well with methylene blue, others only faintly and appear shrunken, while still others are not in evidence at all. The sections fixed in osmic acid demonstrate that the large vacuoles seen in the eosin methylene blue sections are fat globules. The liver apparently presents two distinct fatty changes, namely, fatty infiltration and fatty degeneration. This combination of changes can probably be accounted for in a case of this kind. Lowered oxidation due to impairment of the cardiac function might possibly lead to the former, and the intoxication due to or resulting from sarcomatosis could quite probably produce the latter.

In addition to the fatty changes in the liver there are numerous hemorrhages of varying ages. In the more recent ones the red cells are intact; in older ones they are hemolyzed, and in still older ones there is organization in various stages up to complete fibrosis.

ABORTION DISEASE OF CATTLE

By DON. A. BOARDMAN, *Rome, N. Y.*

WRITING a paper on this subject, one finds a great conglomeration of conflicting theories, hypotheses and facts gleaned

from the literature. Let that be as it may, most investigators agree that the causative factor is *Bacterium abortus*, the Bang organism. Of course there are some other causes of a direct and secondary nature. The mode of infection seems to be through the digestive tract, through the blood stream to the reproductive organs of the female, where it causes either premature expulsion of fetus, a dead fetus at full time, or an apparently healthy individual with retention of placenta, depending upon the severity of the infection and the resistance of the individual animal. The consensus of opinion seems to be that the disease is most easily spread through the vaginal discharges of the aborter during the sixty days following calving. Complete segregation of the animal for this length of time should aid in the prevention of spreading the disease.

A combined economic loss of the breeding power of affected animals plus the resultant retained placenta, sterility and decreased milk production cost this country more money than any other cattle scourge. The treatment of this disease is in the experimental stage. Numerous investigators and research workers have found no specific panacea which satisfactorily copes with the situation. The treatment ranges from the practice of allowing the afflicted cow to shift for herself, selling her to the butcher or to some unsuspecting buyer, to calling in more or less effective professional aid. It is a well-known fact that abortion storms will sometimes clear up in one or two years and not trouble the owner again. In other cases a man never eliminates it from his herd.

The veterinary profession has been trying to cope with the situation for the past several decades, has discovered much about the disease, but as yet is still somewhat in the dark. Serums, bacterins, vaccines and nostrums have been put on the practioner and stockman alike with pretentious claims for their effectiveness, but as yet few, if any, are effectual.

The breeding of noninfected cattle with a clean sire, and keeping such priceless individuals completely isolated from any source of contagion, would be the acme of perfection.

The general practitioner has probably followed the new theories and treatments which have come to his attention. In my limited experience I have tried a few of the various treatments.

In 1920 I had a run of abortion ranging from 10 to 46 per cent of the herd. I will cite my experience on one of these farms.

Sixteen head ranging from heifers with first calf to the oldest cow in the barn aborted. The remaining nineteen did not abort. The fetuses ranged from five to eight months and were born dead and alive. When I was first consulted there were five, all with retained placentas in various stages of decomposition. One of the cows was down, unable to rise, and consequently was destroyed. One other, after removal of the placenta, developed a perimetritis. Due to the straining of the animal, the uterus was tipped up and backward between the floor of the rectum and the roof of the vagina, cutting off all escape of the retained liquids through the os uteri. The following week the uterus was found adhered to rectum and vagina. The cow was off feed and weak behind. A longitudinal incision through the roof of the vagina and through the uterus liberated a copious discharge of retained débris. She was then douched regularly with the rest of the herd and ultimately made a good recovery. She was not bred but sold for beef after the lactation period.

The treatment of this herd was as follows: The placenta was removed manually when ready, the uterus douched with hot normal salt solution and vigorously massaged per rectum. The whole bunch was treated regularly from four to seven days apart as long as any discharge was present or a small stomach tube could be inserted through the os. The cows were all kept on a one-half ounce dose of 1 per cent strychnin twice daily. These cows were not bred under three months following abortion. The bull was flushed out with ¼ per cent Lugol's solution before and after serving. This practice of douching is still carried out today. These fourteen cows all conceived and carried their calves full time, having apparently normal offspring with but one retained placenta. There was one aborter in the herd the second year and none last year. In tracing back the herd's sire we found that he came from a herd which was apparently saturated with infectious abortion. Several of these fetuses were sent to Dr. C. M. Carpenter, at Ithaca, N. Y., who found the Bang organism in all but one. All cows in this herd were sprayed with a 1 per cent creolin solution twice daily. The gutters were likewise treated.

Another herd had six out of twenty abort. These were treated the same except that bacterins were used. One aborted the following year.

In another herd three out of fourteen aborted. Same treat-

ment; vaccinated with live cultures. One aborted, three others the following year.

Last spring I had another herd in which six out of fourteen aborted. The first two were unattended and both died. The other four were treated and douched. These cattle were afflicted with a necrotic form of metritis and vaginitis. One heifer in particular had so much necrosis in the vagina that it was nearly impossible to pass my hand into the vagina. I was afraid it would perforate the walls of the vagina. Tampons of cotton saturated with Flavisol were packed into the vagina and left for several hours. Subsequent flushing of the vagina with the same solution, twice daily, seemed to control the infection. These four cows were bred and all conceived.

In another herd under treatment at the present time I have injected ten head, as fast as they freshened, with live cultures. This herd has been troubled with abortion for the last five years.

SCOTTISH VETERINARY SCHOLARSHIPS

The Board of Agriculture for Scotland has established scholarships for the sons and daughters of agricultural and other rural workers. Courses at the Edinburgh and Glasgow Veterinary Colleges are included. The scholarships are limited in cost to 360 pounds sterling for three years, or 120 pounds for any one year, with additional allowances for class fees and traveling expenses.

FRENCH VETERINARY DEGREES

A bill has been introduced in the French Parliament to create the degree of veterinary doctor to be conferred by the national veterinary schools at Alfort (near Paris), Lyons and Toulouse. Heretofore these schools have awarded only a diploma of "veterinarian" without the degree of doctor, and this has been an obstacle to the recruiting of students. Certain rules will determine the guaranties required for the conferring of the doctor's diploma and conditions under which it will be awarded to those who already have the veterinarian's diploma. The bill provides for a fine of from 500 to 10,000 francs for those who assume illegally the title of veterinary doctor, or who, without being a doctor of medicine, do not mention the title "veterinary" in connection with that of doctor.

ABSTRACTS

THE TREATMENT OF NERVOUS LOCALIZATIONS OF CANINE DISTEMPER WITH FORMINE (UROTROPIN). L. Panisset and J. Verge. Compt. Rend. Soc. Biol., vol. 87 (1922), no. 25, p. 411.

Urotropin may be administered to the domestic carnivora per os, subcutaneously or intravenously. It is broken up in the body into formaldehyde and ammonia, the former being found in the cerebrospinal fluid, the saliva and the bronchial secretion. It is probable that the powerful antitoxin and anti-infectious power of urotropin should be attributed to its decomposition into formaldehyde and ammonia. The authors utilized this marked bactericidal power in the treatment of certain nervous forms of distemper. Of 11 patients treated, 5 died in spite of intervention, 5 cases were cured, and 1 case is at present improving. The medication is more effective if used when first symptoms appear.

There is injected intravenously 1 to 2 grams of urotropin according to the size and weight of the dog. The drug is dissolved in either 5 or 10 cc. of normal salt solution. The injections are repeated each morning for 10 days. Improvement should occur after about the 5th or 6th injection. When a series of injections have produced no result, a similar series of injections should be undertaken after a rest of 10 days. Urotropin merits a trial in the treatment of other forms of distemper particularly the pulmonary or intestinal. The treatment should be instituted early in the disease. L. T. GILTNER.

PYOSEPTICEMIC INFECTIONS IN NEWBORN ANIMALS. L. C. Maguire. Vet. Jour., vol. 77 (1921), no. 555, pp. 334, 335. (Abst. in Exp. Sta. Rec., vol. 47, p. 286).

The author claims to have eradicated white scours from eight dairy farms having a total of 112 cows by treating the pregnant cows with a vaccine prepared from an affected animal on the same farm. The vaccination, which is carried out in the seventh and eighth month of pregnancy, consists of three injections at intervals of 10 days, the first injection containing 10,000,000, the second 25,000,000, and the third 50,000,000 dead bacilli. One

week after birth each calf receives an injection of one-fourth the initial dose of vaccine employed for the cows.

VACCINATION AGAINST BOVINE HEMORRHAGIC SEPTICEMIA WITH ATTENUATED VIRUS. F. D'Hérelle and G. Le Louet. Ann. Inst. Pasteur, vol. 35 (1921), no. 11, pp. 741-744. (Abst. in Expt. Sta. Rec., vol. 47, p. 285.)

Data are presented showing that the virus of bovine hemorrhagic septicemia attenuated by repeated passage through rabbits is capable of producing a lasting immunity in cattle or buffaloes. This virus can be preserved unchanged in macerated rabbit tissue, but if kept in macerated beef tissue it apparently regains its virulence so that fatal results are obtained following inoculation.

COWPOX AND SHEEP POX. J. Bridré and A. Donatien. Ann. Inst. Pasteur, vol. 35 (1921), no. 11 pp. 718-740.

The authors review the conflicting literature on the relationship between sheep pox and cowpox, and report a series of experiments undertaken to solve the question of the identity of these diseases. The conclusions drawn from the investigation are as follows:

Sheep can be inoculated with cowpox virus and can be used for the production of cowpox vaccine. Inoculation of vaccine (cowpox) protects sheep against a new inoculation of the vaccine provided the first inoculation has been followed by a satisfactory reaction. Vaccination against cowpox does not immunize sheep against sheep pox, nor does vaccination against sheep pox immunize sheep or other animals against cowpox. The results are thought to indicate that the virus of cowpox and sheep pox are not identical. Several references to the literature are appended.

NEW TREATMENT FOR THE NERVOUS FORM OF DISTEMPER IN DOGS. G. Lichlenstern. München. Tierärztl. Wchnschr., 1921, p. 779. (Abst. in Rev. Gén. Méd. Vét., Oct. 15, 1922, vol. 31, p. 603.)

The treatment of Lichlenstern is based on the fact that aged dogs do not contract distemper, which proves that the blood of of these dogs contains products (antibodies) which prevent the evolution of the disease.

In order to utilize the blood of aged dogs in the treatment of distemper Lichlenstern proceeds in the following manner: The aged dogs, brought for slaughter, are bled white, and there is added to the blood collected a sterile solution of sodium citrate in the proportion of 10 per cent. The dogs to be treated receive 100 to 500 grams of citrated blood, injected subcutaneously at the junction of the neck and shoulders.

According to the author the results are surprising. Dogs down with grave nervous symptoms are able to get up the second day after the injection, the gait becomes easy, and the improvement becomes so pronounced that after a few weeks the weakness of the hind quarters disappears completely.

PHENOL AND CRESOL AS PRESERVATIVES IN BIOLOGIC PRODUCTS. P. Masucci. Jour. Infect. Diseases, vol. 30 (1922), no. 4, pp. 379-387. (Abst. in Expt. Sta. Rec., vol. 47 (1922), p. 383.)

Contrary to the results reported by Krumwiede and Banzhaf, ether-cresol has been found to be slightly less rather than more germicidal than cresol alone and is considered to have no advantage over cresol alone as a preservative of serum. No marked difference was noted in the amount of the precipitate formed on standing between serums treated with cresol or ether-cresol.

THE VALUE OF COMPLEMENT-FIXATION AND AGGLUTINATION TESTS IN THE DIAGNOSIS OF GLANDERS. A Marcis and R. Manninger. Berlin. Tierärztl. Wchnschr., 36 (1920), no. 29, pp. 333-335. (Abst. in Expt. Sta. Rec. vol. 47 (1922), p. 385.)

The results are reported of serological tests and postmortem findings in 380 horses condemned as glandered. The data obtained were analyzed with respect to the following questions: (1) How often is the anatomical diagnosis of the slaughtered animals in agreement with the blood tests, and (2) how often in positive cases of glanders have the blood and eye tests failed?

In answer to the first question the data obtained show that of 296 cases in which the complement-fixation test gave positive results, 286 proved on autopsy to have glanders. With the agglutination test there were 246 positive results confirmed in 239 cases, while in the eye test there were 228 positive reactions confirmed in 213 cases. Of the 286 cases giving positive results on

autopsy, the eye test alone failed in 8 per cent, the agglutination test in 14, the complement fixation test in 12, the combination eye and agglutination test in 3, the agglutination and complement fixation test in 5, the eye and complement fixation test in 2, and the combination of three tests in 2 per cent.

"ROUGE" OF SALTED MEATS. ISOLATION OF THE SPECIFIC AGENT. Martel and R. Germain. Bul. Acad. Méd., Dec. 27, 1921. (Abst. in Rev. Gén. Méd. Vet., vol. 31 (1922), p. 415.)

In the sanitary inspection of salted meats for the French Army from the beginning of the war the authors noted an alteration termed "rouge" which affected all sorts of such products, but especially bacon and hams of American origin and codfish. The name "rouge" is given to it because of a sticky reddish coating on the product, ranging from pink to wine color, which in contact with water forms a sort of mucus.

Microscopic examination revealed numerous germs, several of which had already been described as agents of "rouge" by Mégnin and Le Dantec; but the authors observed that (1) the quantity of microbes in evidence does not correspond with the abundance of the red coating; (2) the germs in different preparations are often different; (3) there exists in all the preparations a base inclosing the germs and colored with safranin, the blues, thionin, etc.

Cultures on solid media saturated with salt permit the isolation of an agent which the authors consider specific and for which they propose the name *Micrococcus rubroviscosus*. On solid media (codfish gelose saturated with salt, potato saturated with salt, etc.) there appear, sometimes after one month, punctiform colonies, always transparent when they are pure, and which gradually take on a ruby red. In liquid media saturated with salt a fragile red film is formed, which becomes detached and falls to the bottom, to be replaced by another.

The examination by dark field illumination of the aqueous emulsion of a particle of culture reveals the presence of a fine coccobacillus, when examination by ordinary methods has shown nothing. The authors point out this peculiarity to explain the failure of other observers. The specific agent is masked by other microbes to which it adheres by reason of its tenuity and viscosity.

The specific microbe is aerobic; it falls in the class of chloridophiles of Le Dantec. On solid media its development is slow and often it does not appear for a month. It may be cultivated at 10° C.; the optimum temperature is 35° C. After a few months the red tint fades and turns yellow, as on codfish, which when decomposition sets in, takes a yellow tint.

The microbe was found on all the salted meats examined. This ubiquity is explained by the fact that in all the salts of commerce, except rock salt, the germ may be isolated. All salted meats are therefore subject to "rouge." Humidity, heat and lack of aeration are conditions favoring the development of the microbe.

The appearance of "rouge" on salted meat, facilitating by its coating the development of a multitude of germs, is like the first stage of putrefaction, and little by little the characters of "rouge" disappear and give way to a putrid softening. On fat bacon the alteration is benign, as the compactness of the tissue impedes the penetration of the agent; but on codfish, the flesh of which is friable, the "rouge" is very serious.

REVIEWS

OM OKSEBREMSENS BEKAEMPELSE (FIGHT AGAINST THE OX WARBLE). Dr. Laust Brodersen. Maanedsskrift for Dyrlaeger (Copenhagen), Vol. 34, Pt. 13, Oct., 1922.

The facility with which the ox warbles (*Hypoderma* spp.) can be greatly reduced in numbers is mentioned by the author. The situation of Denmark is favorable to entire eradication of this pest in that country provided a concerted fight should be made against it. The Minister of Agriculture proposed a law last winter looking toward the eradication of the pest throughout the country. While this proposal was received favorably by the law-making body it was deemed desirable not to press its passage at that session owing to the danger of the spread of foot-and-mouth disease by those carrying on the work.

After discussing the various methods of destroying the ox warble and pointing out their difficulties and objections the author stresses the advantages of an instrument for mechanically removing the larvae or grubs, which he and an engineer of Copenhagen have perfected.

The instrument consists of a brass pump about the size of a small garden hand sprayer. This is arranged with piston and valves calculated to create a partial vacuum. The lower end of the pump is provided with a suction bell of rubber which is applied to the animal over the warble hole. As this is firmly pressed against the warble the handle of the pump is pulled out and the combined pressure and suction removes the larvæ as well as the pus which surrounds it. He states that in some instances the larvae come out with a single stroke of the pump while in other cases several strokes are necessary.

Before beginning extraction the hide on the back of the animal is rubbed with soapy water to facilitate extraction.

The author states that he has tested this device in extracting about two hundred and twenty larvae from thirty-five animals in different localities. Most of those extracted were in the later stages of development but the author believes that the younger ones could be removed in the same way.

The writer of this review is of the opinion that Dr. Brodersen has made a notable contribution to this field of work in devising this mechanical warble extractor. It is, of course, desirable that the instrument be tried out on a very large scale, especially with different breeds of cattle, some of which are known to have characters of hide which make grub extraction very difficult. If the instrument works successfully under all conditions it would commend itself on account of the greater cleanliness of the work, lessening the chances of bruising the tissue and possibly producing less pain to the animal, as well as its ability to remove the pus from the cysts. F. C. B.

CARRIERS IN INFECTIOUS DISEASES. Henry J. Nichols, M. D., M. A., Major, Medical Corps, U. S. Army, with a Section on Carriers in Veterinary Medicine by R. A. Kelser, D. V. M., M. A., Captain, Veterinary Corps, U. S. Army. Published by Williams and Wilkins Company, Baltimore, Md.

Major Nichols is a member of the Medical Corps, U. S. Army, stationed at the Army Medical School, Washington, D. C., where for several years he has been an instructor in bacteriology, parasitology, and preventive medicine.

Captain Kelser was employed in the laboratories of the Bureau of Animal Industry for over seven years before he resigned to

enter the Army, and he is now director of the Veterinary Laboratories of the Army Medical School, Washington, D. C. Both writers are well known to the members of their respective professions.

This new and interesting work on a very attractive subject consists of 184 pages, including the index, and 11 illustrations, and is divided into four parts as follows:

Part I. General Considerations.—Deals with pathology, diagnosis, treatment, and the importance of the subject of carriers.

Part II. Special Diseases.—Carriers in typhoid fever, cholera, dysenteries, diphtheria, respiratory infections, blood disorders, and sexual diseases are discussed under this heading.

Part III. Summary.—The place of carrier work and the method of conducting it are dicussed in connection with the relations of phorolgy to preventive medicine.

Part IV. Carriers in Veterinary Medicine.—This part of the work is of special interest to veterinarians. The subject is treated under four headings as follows:

1. Carriers of organisms pathogenic for both man and the lower animals. The list includes such bacteria as *Micrococcus melitensis,* various bacilli such as *tetani, anthracis, mallei, diphtheriæ, erysipelatis suis,* and the filterable virus of foot-and-mouth disease.

2. Carriers of organisms pathogenic for animals and possibly for man.—*Bacterium abortus,* streptococcus of infectious mastitis of cattle, and the trypanosomes appear in the list discussed.

3. Carriers of organisms pathogenic for lower animals only. The bacilli *bipolaris septicus, necrophorus, paratuberculosis;* also various protozoa and the filterable viruses are covered under this heading.

4. Conclusion.—Comparisons are made between human and lower animal carriers and the notable features of the subject in veterinary medicine receive attention.

The recognition of the infectious nature of certain diseases marked the beginning of a new era in the theory and practice of medicine, and the observations by Kock in 1892-93 that apparently healthy animals might disseminate the virus of hog cholera led to rapid progress in the explanation and prevention of infections, but comparatively little has been published on this as a distinct subject. Previous to the publication of the work by Major Nichols and Captain Kelser we had in English two monographs on the subject of carriers—"The Carrier Problem in

the Infectious Diseases," by Ledingham and Arkwright, and "Human Infection Carriers," by Simon.

In view of the recognition of the importance of "Carriers" in our fight against disease and the able manner in which the subject is handled by the authors, "Carriers in Infectious Diseases" commends itself to students and to practitioners of both human and veterinary medicine as a reliable, up-to-date work on this important subject.

HOG CHOLERA, ITS NATURE AND CONTROL. Raymond R. Birch, B. S., V. M. D., Ph. D., Professor in Charge of the New York State Veterinary College Experiment Station at Cornell University, Ithaca, New York. Published by the Macmillan Company, New York, N. Y.

The author is well known to the members of the veterinary profession through the research work he has done and his participation in the activities of National and State veterinary medical organizations.

This work, consisting of 311 pages, including 20 illustrations, is divided in 11 chapters, as follows:

History and Economic Importance
Nature and Cause of Hog Cholera
Methods of Dissemination
Complications
Symptoms and Lesions
Diagnosis, Differential Diagnosis, Prognosis
Preparation of Anti-hog-cholera Serum
Methods of Using Anti-hog-cholera Serum
Handling Hog Cholera in the Field
Hog Cholera, Meat Inspection and Garbage Feeding
Control and Eradictation of Hog Cholera

The book presents a pleasing appearance; it is neatly bound, the paper is of good quality and the print is clear. Dr. Birch's work is deserving of a welcome reception, especially at this time when veterinary practitioners are looking for up-to-date information on the differential diagnosis of swine diseases.

U. G. H.

ASSOCIATION NEWS

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo., August 28 to September 1, 1922

(*Continued from the December* JOURNAL.)

THURSDAY EVENING, AUGUST 31, 1922

The meeting convened at 8:10 p. m., President Kinsley presiding.

PRESIDENT KINSLEY: First we have a report from the Executive Board.

REPORT OF EXECUTIVE BOARD

SECRETARY MAYO: Before I make that report I wish to make an explanation. Some evidently have not understood the registration fee of a dollar that was charged here. At the meeting in Columbus two years ago the Association voted to charge a dollar registration fee, to be used for entertainment. The registration fee collected here has been turned over to me and is to be used in defraying the expenses of the clinic only. I wanted you to understand that.

I have a telegram from Dr. Dalrymple, in response to one that was authorized to be sent. "Greetings received with sincere appreciation. Hope meeting unqualified success."

The following applications for membership have been favorably recommended by the Executive Board:

Hugh F. J. Arundel, Blackshear, Ga.
F. O. Whiteman, Carrollton, Ill.
T. E. Norman, Jasper, Ind.
John D. Lyle, Sparta, Ill.
C. W. King, Trenton, Ohio.
W. E. Martin, Perry, Mo.
M. E. Gouge, Sedalia, Mo.
William Tennant, Toronto, Ontario, Canada.
J. J. Hoffman, Cincinnati, Ohio.
C. R. Walter, Tulsa, Okla.

PRESIDENT KINSLEY: What will you do with this list of applications?

DR. CONNAWAY: I move their election.

(The motion was seconded and carried.)

SECRETARY MAYO: The Executive Board recommends that Section 1, Article 17, of the Constitution and By-Laws be so

amended that the Committee on Intelligence and Education shall consist of two teachers of veterinary science, one veterinarian in Federal or Dominion regulatory service, one veterinary military officer and one practitioner.

The Board also recommends that Section 1, Article 5, of the Constitution and By-Laws be so amended as to permit the Executive Board to remit individual dues under special circumstances.

Those recommendations will have to lay on the table a year.

The Executive Board recommends that the report of the Committee on Veterinary Anatomical Nomenclature be adopted and the committee discharged.

PRESIDENT KINSLEY: What will you do with this recommendation?

DR. NEWSOM: I move that it be adopted.

(The motion was seconded and carried.)

SECRETARY MAYO: The Executive Board recommends that the Committee on International Veterinary Congress be discharged

DR. MILLER: I move that the recommendation be adopted.

(The motion was seconded and carried.)

SECRETARY MAYO: It is recommended that as soon as the funds in the hands of the Salmon Memorial Committee be turned over to the Treasurer the committee be discharged.

PRESIDENT KINSLEY: You have heard the recommendation. What is your pleasure?

DR. KELLY: I move it be approved.

(The motion was seconded and carried.)

SECRETARY MAYO: It is recommended that the report of the Liautard Memorial Committee be adopted and the committee discharged.

DR. MILLER: I move the adoption of the recommendation.

(The motion was seconded and carried.)

SECRETARY MAYO: The Executive Committee also recommends that the Committee on Revision of National Formulary be discharged.

DR. SIMMS: I move the recommendation be adopted.

(The motion was seconded and carried.)

COMBINING OFFICES OF SECRETARY, EDITOR AND BUSINESS MANAGER

PRESIDENT KINSLEY: Dr. Way, chairman of the Executive Board, has some further report.

DR. WAY: The Executive Board respectfully submits the following:

At Philadelphia, in 1918, an amendment to the Constitution and By-Laws was presented by Dr. Mayo, providing for the amalgamation

of the offices of Secretary, Business Manager and Editor of the official JOURNAL of the Association, the incumbent of this office to devote his entire time to the affairs of the Association.

A subcommittee of three from the Executive Board was appointed to study the situation and make recommendations to that Board. For two years the committee has carefully studied the situation in an endeavor to make recommendations for the best solution of this question.

Approximately fifty members have been consulted, more especially in reference to their availability to accept the position, and many more have been consulted for advice and suggestions.

At the opening session of the Executive Board at this meeting Dr. Mayo notified the Board that he wished to be relieved of the duties of Secretary as soon as the change could be conveniently made without embarrassment to the Association. Dr. Mayo has worked faithfully and diligently, and at all times has been ready to undertake any task that has been desired by the Board. His records are most accurate, his files are most complete. The affairs of his office have been audited by an expert accountant and found to be in every way accurate and above criticism.

Dr. Mohler, as Editor of the JOURNAL, and Dr. Mayo, as Secretary of the Association, have been consulted, and the situation has been discussed from every possible angle, from a business, financial and policy standpoint, in reference to the advisability of the amalgamation of these two offices at this time. Both of these efficient officers have advised that they feel the step is a wise one, and that they are willing to assist in every way possible in the amalgamation and serve to the best of their ability in consummating the arrangement.

The Board has considered both the present Editor and the Secretary as admirable men for this combined position; in each case the proposition has been declined with thanks and appreciation for the compliment, but for personal reasons it is impossible for either to accept.

The Board wishes to take this opportunity to commend Dr. Mohler as Editor of the JOURNAL for the efficient and satisfactory administration of his duties in connection with the official organ of the Association. The business management is efficient, the records are complete and clear, and an official audit shows his accounts to be correct and in every way above criticism.

In casting about for a suitable man for this position, one possessing all the desirable attributes is difficult to find. Men holding responsible positions receiving, in many cases, higher salaries than it is deemed advisable by the Executive Board for this Association to pay, and working under surroundings that are congenial, can not see their way clear to accept the position.

In the final analysis of the question, the Board has selected and recommends from the men most available Dr. H. Preston Hoskins, of Detroit, Mich., for the position of Secretary-Editor of this Association. He did not seek the position, and by virtue of his training and ability we believe he will be able to serve the Association in an efficient and satisfactory manner. We recommend that the complete amalgamation of the two offices be effected not later than January 1, 1923. Both the present Editor and Secretary have assured us of their full cooperation in consummating this arrangement.

The Board recommends that the position of Secretary-Editor carry a salary of $4,000 for the first year, and providing the services are satisfactory to the Board, that the salary be increased to $5,000 at

the beginning of the second year, future advancement in this respect to be governed entirely by results obtained.

It would seem advisable after three years of careful consideration that the plan as suggested would be to the benefit of the Association. We make these recommendations for your careful consideration, and trust that you may see fit to approve the action of your Executive Board.

DR. WAY: I move the adoption of the recommendation.

(The motion was seconded.)

DR. TORRANCE: I would like to interpolate a question at this stage, because I may be perhaps a little ignorant of the situation. I have noticed that the report of the committee extols in no measured terms the efficiency of our present officers, the Secretary and the Editor, and I feel quite confident that their opinion of these two officers is well merited and is shared by a large number of the members here. But, sir, when prosperity is smiling upon an organization, when everything is running along smoothly, when you are perfectly satisfied with your officers, is that the proper time to make a change, a radical change, in both officers at the same time, taking away the men who have shown by their experience and by their work that they are well fitted for that work, and putting it in the hands of no matter how well-selected a man, but a man who is not conversant with the work and has had comparatively little experience?

I would like to ask, therefore, whether any effort has been made to induce Dr. Mohler to remain as Editor of the JOURNAL for a further period. I feel strongly, gentlemen, that John Mohler's name on the face of that JOURNAL is something like the "U. S. inspected and passed" mark upon a piece of meat. You know the quality is there, and I for one would be very reluctant, if it is at all possible to retain Dr. Mohler's services, to have them parted at the present time. If by any possible way we can retain the services of Dr. Mohler, I think we should, for the benefit of the Association, endeavor to do so; and I would like to have some assurance from the committee that an effort has been made to retain those services.

DR. SHORE: I rise to try to express in some way a second to what Dr. Torrance has just said. I can recall, it seems to me, when the JOURNAL was not as readable a magazine as it is now. Can't we do something to continue this present course that the JOURNAL has taken? Isn't there some way that we can ask the Executive Board to reconsider this action, and if possible get Dr. Mohler to remain in charge of the JOURNAL for some future period?

DR. EAGLE: I can not see, from a financial standpoint, how they expect to better the condition of the Association by removing both of these gentlemen at this time, or doing away with the two offices and amalgamating them into one, if you are going

to pay $4,000 the first year and at the end of that time $5,000 a year, or the combined salary that I understand the two men are getting now.

Anyone who had any experience or paid any attention to the JOURNAL previous to the New Orleans meeting knows what that JOURNAL was. I don't know who the Editor was. I make no reflections on him, whoever he was. But we know we did not get the JOURNAL regularly. Furthermore, if we will take the report as submitted by Dr. Mohler and approved by this body of men, we will note the increase in profit in this JOURNAL in the last year. I am frank to tell you that as commercial men we feel more like putting our ads in this JOURNAL with Dr. Mohler at the head of it than we ever have before—I don't say better than we ever will, but we will feel better with Dr. Mohler as Editor of that JOURNAL. I can not see why at this time it would benefit this Association to amalgamate these offices.

DR. A. E. CAMERON: May I ask if the decision of the Executive Board was unanimous?

PRESIDENT KINSLEY: That is a pertinent question. I don't know whether it is answerable or not. I will leave that to the Executive Board.

DR. TORRANCE: We have had no reply from the committee in regard to this question that I asked, and before the question of adopting their report is put to the meeting, I think they should be given an opportunity.

PRESIDENT KINSLEY: I thought it would be well for anyone who wanted to discuss the report to discuss it first. If there is nothing further we will ask Dr. Way to answer the questions that have been asked.

DR. WAY: As for the question of the management of the offices of the JOURNAL and of the Secretary, the Executive Board I think clearly expressed in their report the attitude of that body toward the present incumbents of these offices.

In Philadelphia an amendment to the Constitution and By-Laws was presented to amalgamate these two offices. At Columbus the amendment was adopted. The Association signified to the Executive Board, by amendment to the Constitution and By-Laws, that it wished to combine the two offices.

With reference to Dr. Torrance's question, we of the Board very much desired that Dr. Mohler accept the combined position.

In reference to the unanimity of the Executive Board, the report as submitted has been approved by all the members.

I don't know that there is anything more I can say. We simply interpret your instructions, or the instructions of the Association, in a desire that the two offices be amalgamated, and we submit our report.

DR. WHITE: There seems to be a struggle here between a very beautiful sentiment and a hard-headed business. I have been a member of this Association over a quarter of a century. I have admired its sentimentality but I have often doubted its wisdom in a business way. The majority of the membership undoubtedly must have had this feeling some three years ago when this change was proposed. The change was to professionalize the offices of Secretary and Editor so that we might have a continuous administration. This went even further; it was hoped to include a permanent home for the Association. Your Executive Board was requested to make a study of this matter and report. A report is now before us. We have been procrastinating in this matter for about three years, and we are not getting anywhere. In the meantime, our Association is hardly holding its own in membership. Our funds are not increasing. Here a small handful of us represent what is probably the largest veterinary association in the world. If we wish to become a power in veterinary policies and politics in North America, I feel that we must sweep aside any sentiment we may have in the matter and get down to good, hard-headed, practical business. One of the first steps in this direction, in my opinion, is the establishment of a permanent secretaryship, and personally I feel that before we get where we wish to get we will have a permanent meeting place.

In the State of Ohio our State Association has a much larger turnout than does our National Association.

Dr. Mohler is one of my best friends. If I thought for a moment it would be possible for him to accept this permanent secretaryship, I certainly would vote in his favor. He has been asked but obviously he has had to decline it.

When I was President of the Association I found Dr. Mayo one of the most efficient, pleasant, honorable and upright gentlemen I ever have had the pleasure of dealing with. He also is unable to accept the position. In the neighborhood of fifty members of the Association have been approached, but for reasons given they can not accept. As what might be termed perhaps, therefore, a compromise candidate, Dr. Hoskins has been suggested. In the light of these things I trust that the report of the Board will be adopted, because I feel that it will be for the best interests of this Association, and make a greater power in framing veterinary policies and in controlling veterinary politics in North America.

If we continue on in this way, in my opinion in five years we shall be no more powerful than we are today. An association can not stand still; it must either go forward or go backward. Tonight you gentlemen are to decide whether to proceed or retrogress. In my humble opinion, to sustain the report of

this Board will be to progress. I, therefore, shall vote for the motion.

DR. FITCH: I happened to be present at this Association meeting when the motion was originally placed before it to combine these two offices. There was considerable debate before the Association at that time as to the wisdom of that policy. After some debate it was unanimously adopted that such a policy was a wise one for this Association to take. It has not been an easy thing to find a man who could and would fill this position. I might say that I was one of the men who was approached as to availability, but it is a position which entails trust and work and responsibility, and one does not always feel that he can leave a position in which he has partially succeeded to take one which is possessed of more or less doubt.

This Association in the election of a combined Secretary or a permanent Secretary and Editor is following the lead of associations in other lines. It is following a policy which not only has proven its worth, but is one in which this Association can have a great deal of benefit, and it would seem to me that after four years' consideration—one year in the consideration of the amendment and its adoption and three years in the selection of a man—it would be a step backward if this motion did not prevail.

DR. UDALL: The question upon which you have been called to pass is one that involves far more than the personality of any individual or the temporary success of any journal. It is a bottom-stone of the principle and of the policy for which this Association intends to stand. I believe I am correct in the statement that our profession, as large as it is, is a service incidental to the livestock industry of this country. We are made up of various groups—practitioners, representatives of commercial houses, teachers, investigators and regulatory men. The administrative office of this Association should be free from the entanglements of any single group. The administrative office of this Association and the policies and the principles that are best for the livestock industry and for the Association as a whole are of infinitely greater importance than the selection of any particular individual or the publication of any journal.

Issues of tremendous importance to this industry and to this profession are immediately ahead of us. These are issues that are not peculiar to this profession; they have been before the medical profession for a considerable time. Briefly stated, the one of chief importance at the present is the correlation of state service for the control of disease. There appears to be antagonism between these two groups, complaints arise from stock owners, from practitioners, from individuals of each group of our profession. The proper correlation and the proper under-

standing of the questions that underlie this issue are ones that must be settled for the good of all concerned.

We stand here representing to a considerable extent the leadership of the profession. At home many of our colleagues will ask, as they have asked, "What does the profession mean to me? What does the National Veterinary Medical Association mean to me?"

We have had an excellent clinic for the practitioner; his interests have been carefully looked after; there has been recognition of the fact that this body of men, constituting about 85 per cent of our members and the élite of the profession, should be properly recognized; but we have got to do more for these men than merely to provide source of instruction and entertainment. They want to know where we stand upon the principles that affect their service. I want to know whether I can say to my clients, whether in the advice that I am giving in serving, in my service as a private individual, I am supported in this advice by my national organization.

We representatives of livestock organizations stand for a policy that seems to be wise both for their interests and for our interests. I would like to feel that my colleagues in regulatory work, in institutional work, and in all the different branches of profession take me equally with assurance. That is the issue before us, and in voting upon the adoption of this recommendation you are expressing to the mass of men who constitute our profession the indication as to which way you lean, whether in this issue of correlation of state medicine and of private enterprise you are leaning to domination by state medicine or whether you are willing to set up a policy in which your representative is controlled by all of the various elements of the organization and to which all can come with equal opportunity and fight the battle if it is necessary.

DR. CONNAWAY: I wonder if we haven't had enough oratory on this? Even if the water is a little cold, let us try it. I think we will make no mistake. This young man is young because it isn't his fault. In time he will outgrow that. It is no fault of his that he is young; I am glad he is young; but he has had experience. I think we ought to vote on this very promptly.

DR. TORRANCE: I do not wish to delay the decision on this matter, but I feel that I have a duty to perform in asking for a definite reply to the question which I addressed to the committee; that was whether Dr. John R. Mohler had been approached with a request to continue the editorship of the JOURNAL for a still longer period. The reply which I received was that he had been offered the position of dual importance, the position combining the secretaryship and the editorship. That was not what I asked. I don't know that it is absolutely

necessary for these two positions to be combined at the present time, and I feel strongly that it is in the interest of the Association, even if it is necessary to postpone for another year the amalgamation of these offices, that we should endeavor to retain the services of Dr. John R. Mohler as Editor of this JOURNAL.

It is not necessary from a business point of view at the present time to make this change, because the JOURNAL has been progressing. Everybody admits that it is more prosperous in a commercial way, more influential in a literary way, than ever before. The Editor is a man of culture, who understands foreign languages, who is able to read foreign literature, and now we propose to let him out and put a man who has had comparatively little experience in journalism, and to combine with that the office of Secretary.

I believe in progress. I have been a member of this Association a long time. I have its interest as much at heart as my friend Dr. White, who recently spoke. I fully believe that before you take a step you should see that you are going in the right direction. Now, I doubt very much whether this is a step in the right direction with regard to John R. Mohler, and I would, therefore, move that this recommendation of the Executive Board be referred back to them with the object of ascertaining whether it is possible to employ the service of John R. Mohler for a longer period.

(The motion was seconded.)

DR. WAY: I rise to a point of order. There is a motion before the house.

I am sorry that I didn't answer Dr. Torrance's question in a way that he desires. I will endeavor to do so now.

Dr. Mohler told the Executive Board that he would be glad to assume the responsibility of the JOURNAL for another year, or that he would be glad to relinquish the editorship of the JOURNAL at this time. We all felt (I speak for the members of the Board as a whole, I think) that it would be better to effect this amalgamation by extending it over a longer period of time, but for reasons that were presented to the Executive Board, it was finally decided that the amalgamation should take place in four months, or by January 1.

I think that states the position or the question as it has been discussed with the Editor and with the Secretary by the members of the Board.

The point that the Board wished to bring out is this: That this Association has by amendment to its Constitution and By-Laws instructed the Executive Board to effect this amalgamation. If the Association didn't want the Board to effect this amalgamation, why did it give the instruction? We are acting as a part of this Association; the Executive Board is sort of a clear-

ing house, and we submit to the best of our ability the results of the deliberations of the Executive Board on a question regarding which you have given very definite and decided instruction. We trust that the motion may prevail.

PRESIDENT KINSLEY: State your point of order.

DR. WAY: There is a motion before the house.

PRESIDENT KINSLEY: This motion to refer back takes precedence.

DR. WAY: I accept your ruling.

DR. BUTLER: It seems to me that Dr. Way has taken rather a peculiar view of this matter. There is no assumption, so far as I can see, that the Association doesn't still want the offices amalgamated; but may I not ask that there may be some question of the wisdom of the way that they are amalgamating? If they had separated the report so that the Association could vote upon these two problems separately, there wouldn't be any question in my mind but what they would still vote to amalgamate the offices. But I can see that there might be a very great difference of opinion as to whether you were wisely amalgamating them or not; whether it was wise to amalgamate at all at this time if you had to take a young man, however brilliant, however honest, however capable in so far as experience would permit, a man certainly not having had such a broad experience to be in touch with the various departments of the profession as outlined by Dr. Udall, a man who has not yet had that growth and development to fit an office of this size—the biggest office in the veterinary profession in America today, the office for which you should pick out a man of mature years, of broad, mature experiences, and a man of known and tested executive ability and known and tested ability to handle a proposition of this sort. If it is necessary to pay $5,000 or $6,000 or $7,000 a year to get that sort of a man, it is infinitely better as a business proposition to go out and find a man you want, the man who is suited, and then get him, and a thousand dollars in salary should never stand in the way.

Personally, I believe in the amalgamation of the offices; but I say with all due respect to Dr. Hoskins—I have it from every hand that he is brilliant, that he is honest, that so far as his experience goes he is extremely capable—that Dr. Hoskins has not had that broad experience, has not attained that age and experience which are necessary for such an office as this. That is the only reason that I am going to vote against this amalgamation.

DR. WHITE: I would be perfectly willing to pay our Secretary $15,000 a year. I wanted a Packard, but I got a Ford. I had only $328. The income of this Association is not unlimited. If it were possible to pay a permanent Secretary a decent salary

and at the same time retain Dr. Mohler as the Editor, I would be more than pleased to vote for that proposition; but I am assured that the income of the Association at the present time would not permit of this extravagance. This, of course, is a compromise proposition. I have no objection to paying whatever you want to if you have got the money.

DR. EAGLE: It looks to me like an association with $30,000 in the treasury could afford to buy a Packard in preference to a Ford. Now the increase last year, as I understand it, in the receipts from this JOURNAL alone was $5,900 increased profit, and it does appear to me that they could afford to pay a much better salary than they are offering under the present conditions. I think this Association with $30,000 in the treasury is in a pretty prosperous condition.

DR. KELLY: I personally think it is a serious thing to exchange two experienced men for one inexperienced man. Now, I don't mean any reflection on Dr. Hoskins personally, but if we can not at the present time get a person in a business way to manage it for the present salary which is offered, I think it is well enough to defer it. No business corporation or any other firm would take an inexperienced manager to fill the two most important offices in its corporation. I think it is inadvisable to make the change at the present time.

DR. LYNCH: I hope that you gentlemen will pardon me for speaking on this subject, being only a member of your Association at this meeting. I am a young man and a practitioner. I want to tell you gentlemen that I favor this amalgamation, and I favor a paid Secretary who is going to devote his entire time to this work. A great many of the practitioners throughout this country are absolutely dissatisfied with this Association, and there is nothing in the world that will bring those men to a realization that this Association is the one big need of their lives like having a man who is paid, who can go out into their associations, into their home States and carry the message and tell those men who are unable to come here what this Association is doing and show those men that this Association is really functioning and wants to function for that great mass of practitioners who today feel that this organization is not organized for them.

I take exception to the gentleman who said that he questioned the man whom the Executive Board had recommended for this office. I don't know the man, but I always have objected to the fact that anybody will say that a man has to grow a beard before he is able to run an organization. Throughout the breadth and length of this great country the young manhood of America is coming to its own. As I sat there and listened to a man say that because he isn't gray-headed he can not be a successful secretary, I felt that if the Executive Board,

which is made up of competent men, has seen fit to choose him, he is good enough for me.

DR. BUTLER: I didn't get up to make a reply to the whisker part; I have too much sense to answer that sort of an argument; but I wanted to answer Dr. White. Any business organization would not put a young man in there to manage it completely. I didn't mean that because he was young. I know there are men 25 years old that have a good deal more sense than Dr. Kinsley or myself, even if we grow chin beards; but any man who is going to manage as important a proposition as this has got to have experience, I don't care whether he is 25 or whether he is 50 years old, if he has had the right kind of experience; but he can't get it at 25. That is what I meant. I didn't mean any reflection on Dr. Hoskins. I didn't mean any reflection on boys, because I know a lot of 25-year-old boys that will know a good deal more than 60-year-old men. I would never hope, even if I grew a much longer beard, to have as much sense as he has; but it takes something more than sense—it takes experience and development in the work that he is going to manage, if he is going to manage as big a proposition as this.

DR. HART: This is a very serious proposition that has come up all of a sudden before an association which has been running along very smoothly for the last several years. I am not fully acquainted with all things that have transpired, but from what I see there are two questions that are bringing up this discussion. One is the experience of the man that is going to take the place, and the other is the moving of the time of making the transfer from July 1, 1923, to January 1, 1923.

There is a motion before the house to refer this back to the Executive Board. I feel satisfied that if this goes back to the Executive Board and they come back with a recommendation that this change be made to take effect July 1, 1923, there will be a unanimous agreement on it, and it seems to me that the importance of that unanimous agreement is greater than whether we delay six months longer or not. I have perfect confidence in the experience and in the ability of Dr. Hoskins to carry out this work. I believe that all we need to do is refer this back to the Executive Board to have the change made July 1, 1923, and it will be a unanimous agreement.

PRESIDENT KINSLEY: The question before the house at the present time is to refer this back to the Executive Board and have them ascertain and report whether or not Dr. Mohler will accept the editorship for one year.

(A rising vote was called for. Fifty-four voted for the motion and 60 against it. The motion was lost.)

PRESIDENT KINSLEY: If there are no further remarks we will vote on the original question.

(The motion was carried.)

DR. HOSKINS: Take a look at your Ford, gentlemen. I can't say that it has been extremely pleasant to listen to the debate during the past half hour or so. I should like to have been somewhere else.

As the Chairman of the Executive Board said, I did not seek this office. They came to me, and it was with considerable hesitation that I finally consented to allow my name to be considered. It was not that I doubted my ability to conduct this office. I am a young man, I will confess. I have had some little experience. I wouldn't like to have to enumerate the various secretaryships that I have held, but I might say incidentally that I have been doing editorial work for nine or ten years.

The prospects of assuming this office which the Association has been kind enough to bestow upon me makes me feel very much as I did just before I was going to be married. I looked forward to the event with keen anticipation and pleasure. I also felt fully conscious that I was undertaking a big jump.

I am not going to tell you what I am going to do with these offices. It is hardly within the province of the Secretary to say what the policy of the Association will be, but I give you my solemn pledge that I will put my entire heart and soul into the work, and that if necessary I will devote 365 days of the year to carrying on the work.

I doubt if there is a man in the audience who does not agree with practically every remark that was made this evening about conditions generally. Dr. Lynch, I believe it was, said he didn't know me, and I don't think I ever met Dr. Lynch, but he spoke of the practitioner. I have also been a practitioner; not very long, I admit, but having been raised in a veterinary atmosphere, I am fully aware of what the man in active practice has to contend with. My close association with the practitioners of Michigan during the past six years has kept me in very close touch with their situation, their conditions. I believe I know just about how they feel, and when I say that the feeling is quite general that the American Veterinary Medical Association has not done everything that it could for the private practitioner, I doubt if anyone will contradict me. The main reason for that, as I see it, has been because the Association has been slow in taking the step that it has taken this evening. They have had the right idea, they have diagnosed the case, and the only reason why more has not been done and a better feeling, a more confident feeling among the practitioners brought about, has been because the Association has not provided the means for doing

just that thing, and that was undoubtedly the fundamental idea in making provisions for somebody to devote his entire time to this office.

As long as the veterinary science is the diversified profession that it is, just so long as we have veterinarians engaged in such a great variety of work, just so long is this Association going to be made up of these different groups. We should lose sight of the fact that we are practitioners or that we are educators, teachers, or sanitary control men. As Dr. Cotton says, we are veterinarians, and as veterinarians we should look after our own welfare. Just so long as we have any feeling that one group of men is dominating the Association, that Association is not going to enjoy a healthy existence. So the only thing to do is for everybody to get together and pull together, and I don't doubt but what it will be a very short time before this condition which has been referred to among the rank and file of the practitioners will have disappeared.

I am not going to tell you men that I need your help, because you know it. I am not going to ask you men to give me your help, because I know that it is not necessary; I know that you will give it. If you didn't get the import of the Executive Board's report I am here to tell you that I am taking this position on probation, subject to giving satisfaction.

ADDRESS BY HON. CLARENCE OUSLEY

PRESIDENT KINSLEY: We have delayed our literary program considerably. I want to assure you that the rest of the evening will be more pleasant and more interesting than that that has gone before.

The first speaker on our program this evening is a man of national and international reputation. He is a gentleman who has no second in the knowledge concerning agriculture, and particularly does he know the relationships of the veterinarian and the agriculturalist. This gentleman was Assistant Secretary of Agriculture during the period of the war. He was formerly director of the Extension Division of the A. and M. College in Texas. He is an agricultural economist. I am pleased to introduce to you the Honorable Clarence Ousley, of Fort Worth, Texas.

(Colonel Ousley delivered his address, which was published in the JOURNAL for October, 1922, page 13.)

DR. QUITMAN: There is no doubt that we have listened tonight to the treat of the convention, to a most wonderful, broad, comprehensive address by the Honorable Clarence Ousley. I am first going to make a recommendation, and follow it up with a motion.

I do not think that if we appointed a dozen men to draft a

propaganda article we could better the address given by the Honorable C. Ousley. I therefore suggest as one of the duties of the new Secretary-Editor that we have at least 5,000 copies of this address printed and a copy sent to every member of this Association, coupled with the suggestion that he have it published in his local paper or papers, and if the opportunity presents itself, that he read it before the local agricultural or farmers' associations. I make that suggestion, and if a motion is necessary I will follow it up with a motion. While I am on my feet I want to move a rising vote of thanks of this Association to the Honorable C. Ousley for his most splendid address.

(The motion was seconded and carried by a rising vote.)

DR. QUITMAN: I move that the Secretary be instructed to have printed at least 5,000 copies of this address and that a copy of it be sent to each member of this Association with the suggestion that he endeavor to have it published in his local newspapers or farmers' publications if possible, and that he also endeavor to read it before the local farmers' or agricultural associations.

SECRETARY MAYO: This, of course, will be published in the JOURNAL, and I think it should be referred to the Executive Board. I therefore move it be referred to the Executive Board for full consideration as to the best way of distributing this splendid address.

(The motion was seconded.)

PRESIDENT KINSLEY: It has been moved and seconded that the matter relating to Mr. Ousley's address be referred to the Executive Board.

DR. QUITMAN: I think that that just means a delay. This is a question I think that is very clear to us all. The Honorable C. Ousley showed a comprehensive knowledge of our problems, just as good and just as well as we understand them ourselves, and he has pointed out the ways and means of combating the problems that confront the profession. To refer it to the Executive Board I think just means a loss of time. I believe that this Association has a right to formulate some plans of its own regardless of the Executive Board.

If it is published in the JOURNAL many of the veterinarians who are not present at this meeting will delay reading their JOURNAL. This iron should be struck while it is hot. I believe that if it is sent to them separately, it will attract the attention of the veterinarians. You must remember that there are about 4,000 of our members who are not present at this meeting, and we want to reach them by the direct method. While I approve most heartily of it being published in the JOURNAL, still I maintain that the direct way is the best.

DR. FITCH: Personally I would like to have some extra

copies of this address. It is not an easy thing to send a JOURNAL to various members of staffs and other organizations to whom I would like to send this.

DR. MERILLAT: I am rather inclined to believe that Dr. Quitman's motion is out of order, because the Constitution provides that all matters of publication shall be considered by the Executive Board. It is out of order because it is unnecessary.

DR. QUITMAN: I will amend my motion with the consent of my second. I believe that Dr. Merillat has the right idea about the Constitution and By-Laws. I will amend my motion to read that the Executive Board be instructed to have printed at least 5,000 copies. If they see fit, make it 10,000 copies. Like Dr. Fitch, I would like to have a number of extra copies myself, and I believe that our members will be writing for extra copies.

(Accepted by the seconder.)

PRESIDENT KINSLEY: With your permission I will declare the motion referring this to the Executive Board out of order and accept Dr. Quitman's motion.

DR. WAY: I am very sorry that the Executive Board has gained the reputation of being very inactive. There will be a meeting of the Executive Board before 12 o'clock, and I trust that before the midnight hour the address will be well on its way toward publication.

(The motion was put and carried.)

HON. CLARENCE OUSLEY: Will you allow me to say a personal word to express my very deep appreciation of your kindly acceptance of my remarks? If I have voiced the ethics and the concept of this Veterinary Medical Association, I owe it to the fact that for three years, as Director of Extension, I sat at the feet of Dr. Mark Francis, and for two years at Washington, as Assistant Secretary of Agriculture, I sat at the feet of John R. Mohler. (Applause.)

PRESENTATION OF PAPERS

PRESIDENT KINSLEY: The next number on the program is "The Trend of Veterinary Practice," by Dr. W. H. Welch.

(Dr. W. H. Welch presented his paper, which was published in the JOURNAL for November, 1922, page 140.)

PRESIDENT KINSLEY: We have one more address, and I know you are all interested in it. It is the first general paper we have had concerning military operations of the War Department. I take great pleasure in calling on Major Robert J. Foster, who will discuss briefly "The Veterinary Reserve Corps."

(Major Robert J. Foster presented his paper, which will be published later.)

The meeting adjourned at 11 o'clock p. m.

LARGE-ANIMAL CLINIC

WEDNESDAY MORNING, AUGUST 30, 1922

The Large-Animal Clinic was held at the stockyards in East St. Louis. The first session convened at 8 o'clock a. m., Dr. H. E. Kingman presiding.

TUBERCULIN REACTORS—D. F. LUCKEY

Dr. D. F. Luckey gave a demonstration of reactors to the tuberculin test.

DR. D. F. LUCKEY: We started in on a bunch of cows that have just recently been tested and condemned, and, as you know, we would not get the type of reactions that we would expect in a bunch of cattle that had not been previously injected. We handled this lot of cows so that we would have right at this hour the maximum of ophthalmic, intradermic and subcutaneous reactions, but I failed completely.

These nine Holstein cows were injected a week ago yesterday and shipped in here, and then Sunday morning I gave them an intradermal injection. The 48-hour observation yesterday morning at 8 o'clock showed much more pronounced swelling than they show this morning. The last four cows showed good reaction. Two show slight reactions to the intradermal tests.

Tomorrow at 3 o'clock these carcasses will be hung up at Armour's with the lesions in, with the numbers of the cows corresponding to the numbers that are on them now, so you can take your test sheets and compare the numbers and compare the tests with the lesions.

This herd was examined at the forty-eighth hour and at the end of the seventy-second hour. If I went into a herd of cattle with as bad a history as this herd had, I would examine them at the forty-eighth hour and the seventy-second, and I would keep on examining them until they quit reacting. That is why I say we can't follow the rule. We have got to go down the line and test these cattle and get the reactions if we have to stay with a herd a week. Ordinarily they are through at the seventy-second hour, but occasionally a cow will show a good reaction on the fourth day.

Probably Dr. Kiernan will have some specific information on that point.

DR. KIERNAN: On all tests you will get late reactions. I think there are exceptions.

DR. LUCKEY: There are exceptions, but they will do a lot of damage in a herd of cattle like this. It pays to be very thorough. Some of these are very valuable cows; they are all registered. There were 86 head. We made a guess we would find 40 or 50 reactors, and fortunately we only had 15. Some of these are

high-priced cows, and in that kind of a herd it pays to be very careful.

QUESTION: What is the maximum amount or about the regular amount of tuberculin you inject?

DR. LUCKEY: I am somewhat at sea. I just make a rule of injecting enough to produce a very plain and visible lump, showing that the tuberculin is in there. I have been of the opinion that the amount of tuberculin didn't matter much, and I was rather inclined to think that if you could reduce the injection down to 2 minims you would get better reactions. Dr. Augspurger told me last week he injected the left fold with 2 minims and the right with 5. I got better reaction with the 5 minim injection. I don't know whether that will be a regular thing or whether that will be a mere instance. I am not prepared to answer questions specifically, saying that the dose should be 2 minims or 5 minims, but I think the average man will find that he has averaged 4 or 5 minims.

QUESTION: What is the size of your subcutaneous dose?

DR. LUCKEY: The chart there shows that the first six cows got 6 c.c. yesterday after 5 o'clock and the last six got 8 c.c., and you will see that it made very little difference in the reactions; probably the last six cows reacted a little better. I will let you study the chart.

QUESTION: Are you using the so-called deep intradermic injection or very superficial?

DR. LUCKEY: I make the injection with an 8-inch needle, and I would call it a rather shallow injection. Back in 1917 I started with scratching the skin, and I got nice reactions. I wouldn't be sure about it, but I am inclined to think that the shallow injection is the proper one.

On this subject of tuberculin testing, I want to make another point that has occurred to me. If you inject 6 or 8 or 10 c.c. of tuberculin into a lot of cows, and you have an early or late reactor, and miss, you surely have a plugged cow in your herd. In testing cattle I have been going on the theory of keeping all the tuberculin out of them we possibly can. Generally I start on a new herd with a small intradermal injection. Watch out carefully and try to eliminate all the reactors. Take out all reactors and disinfect. In ninety days repeat the intradermal injection and try to take out the recent developed cases. Then let them go a year from the first test, and my preference would be to give them a 2 c.c. subcutaneous injection. If you get reactors still, remove, clean up, and in ninety days give them a 4 c.c. injection. If the herd is not sound then, you are getting into pretty deep water, because you might then conclude that you have a nonreactor in the herd.

ORGANS OF REPRODUCTION—W. L. BOYD.

CHAIRMAN KINGMAN: Dr. Boyd will give a demonstration of gravid and pathological uteri.

DR. W. L. BOYD: We have some very interesting specimens here this morning, both of the gravid and ungravid normal uteri, and other reproductive organs. We also have some very interesting pathologic conditions. These specimens are practically all fresh, so that they are almost in a normal condition, and they are much better to handle and much better to demonstrate with than the frozen specimens. Nearly always the frozen specimens have undergone some postmortem changes, some changes indicating that they have been broken down, and after they are thawed out they never have the same shape as the fresh specimen.

It is well for one who is doing sterility work or expects to take up treatment of sterility in cattle to familiarize himself or reacquaint himself with the anatomy of these organs and to find out their position in the open heifer or the unbred cow. Determine or learn to determine the difference of position in case the uterus be gravid or nongravid, or whether it be in a diseased condition.

It is surprising what one can determine after he becomes familiar with the technique employed in a rectal examination or manipulations. As one keeps up this sort of work he becomes a better diagnostician of many diseases other than those of the reproductive organs.

There is a rather common disease among dairy cattle, sometimes resulting as an aftermath in mastitis, or possibly after metritis, a case wherein the kidneys become infected, and there is a pyelonephritis, or perhaps some other infection of the kidneys. The kidneys can be readily palpated after one has had a considerable amount of experience; the uterus can be palpated, and one can palpate some of the lymph glands and readily detect what is known as fat necrosis. Fat necrosis is quite a common condition among fat cattle, among the dairy breeds, especially those animals that have been fed on a rather high protein diet and pushed for a milk record. Fat necrosis is also quite commonly seen in some of the beef breeds. One soon learns to recognize the shape of the bladder and its consistency and to differentiate it from the uterus. Many times the bladder will be distended and pushes the uterus out of its normal position, and in attempting to diagnose pregnancy one may feel the bladder and think perhaps that is a distended uterine horn and think that there is a case of pregnancy.

In the small animal one can tell a great deal about the reproductive organs through rectal palpations, so the more of this sort of work we do the more efficient we become. I think that everybody who has an opportunity should first station himself in a packing house for two or three days. You will have an opportunity to examine the organs and even to examine some of the cows before they are slaughtered, and see the difference in the different stages of gestation and in the different periods of growth in the corpus luteum. One who avails himself of such an oppor-

tunity is going to be much better prepared to know what he is doing when he attempts to treat the sterile animal or to make a diagnosis of pregnancy.

One should be absolutely familiar with the normal organs, because there are some changes in a diseased condition which resemble pregnancy, and if he is not familiar with those conditions he sometimes gets into serious trouble.

The ovaries of the cow can be very readily palpated. In most cases, in the unbred heifer or the open cow, part of the uterus is on the pelvic floor, but of course just as soon as gestation begins the uterus extends forward and becomes abdominal in position rather than pelvic. The beginner in making rectal examination frequently introduces his hands and arms too far, slides over the uterus and the ovaries, and wonders why he is unable to find those organs. Again, one should use great care in making rectal examinations so as not to cause any more hemorrhage than is necessary. The less hemorrhage you produce the better, and it looks much better to the owner. By careful manipulation you can put a great deal of pressure upon the ovary through the rectal wall. Many corpora lutea can be suppressed by pressure exerted on the rectal walls without any danger. Some of them are so deeply embedded that it is an impossibility to remove them in that way. In those cases one can remove them by exerting pressure through the vaginal wall. Of course, the walls of the vagina are very heavy; this organ is quite muscular and will stand a great deal of pressure, and little or no harm can be done working through that channel.

The corpus luteum is a gland of internal secretion, a gland made up of large epithelial cells. The coloring matter is known as carotin, similar to the color you see in yellow corn and other material of that sort. This corpus luteum forms in the ovary after ovulation, after the ripe follicle has been discharged; then there is some hemorrhage. This undergoes absorption, and the cells known as the cells of the corpus luteum begin to multiply. There is some debate perhaps as to just the origin of these lutein cells, but they probably come from the cells which go to make up the ripe Graafian follicle. Then these cells begin to multiply and grow in size. If the animal is not bred, this yellow body (the corpus luteum) grows to a certain size and then starts to degenerate in most cases, and disappears again in twenty-one days, so that the animal is again in estrum. If the animal is bred and fertilization take place, the corpus luteum grows and keeps multiplying in size until you wonder if there is any real ovarian tissue there; the corpus luteum takes up almost the entire part of the ovary. You may press out a corpus luteum, and then if through straining the cow removes the ovary from your hand, you may have difficulty in picking up what is left of the ovary; that is, there will be a very small amount of tissue left, but you can soon recognize that through grasping the broad liga-

ment. You will find a very small amount of tissue left in some of those cases because the corpus luteum grows so large and takes up most of the ovary.

We have the false and the true corpus luteum, and we have them forming every time that ovulation takes place. In case conception or fertilization does not take place, this yellow body soon disappears; but in case of fertilization it starts to grow and grows to a size of an ear of corn. In some cases where fertilization has not resulted the corpus luteum does not degenerate, but grows and becomes as large as a normal corpus luteum or the corpus luteum of pregnancy; and then that corpus luteum inhibits, in many cases, further ovulation, so that the cow is not coming in estrum any more, and the owner wonders why this animal does not come in heat.

The corpus luteum of pregnancy has a considerable amount of function to perform in relation to the development of the fetus. It is well known that if the corpus luteum is pressed out at the early stage of pregnancy it is invariably followed by an abortion. Sometimes if the entire organ is not removed, in case we are trying to produce an abortion, and a small amount of it remains, the abortion does not take place in many instances, because there is enough of the secretion to govern development of the young animal; and so it goes on and multiplies and the cells regenerate, and we have a corpus luteum formed again.

It is remarkable, in some cases where one wishes to produce an abortion by expulsion of the yellow body, how difficult it is at times, by pressing out the corpus luteum, really to cause an abortion; but if it is removed in its entirety the abortion takes place within a few days following. So the corpus luetum has the function of governing the development of the young animal in the early stages of gestation. It has this function also: It has something to do perhaps in the relation of estrum. We believe that when a cow has recently calved and is not coming in heat, in two to four months and sometimes longer the corpus luteum in some way is interfering with estrum. We think it is partly due to mechanical obstruction; that it is in the ovary in which the yellow body is located; the ova are not ripened and do not get a chance to come to the surface and escape. The opposite ovary is apparently normal in every respect, yet ovulation does not occur there. So if this yellow body is pressed out, and there are no other pathologic conditions in the animal, estrum will take place within about three to five days, sometimes earlier and sometimes later.

From our experience the corpus luteum can be very safely removed if one will work carefully and take precautions to check any hemorrhage that may occur. The pitfalls connected with removal of the corpus luteum are not serious. Occasionally we may get a serious hemorrhage and even death, but as a rule the conditions following are not bad. Occasionally upon the removal

of a corpus luteum we will notice, if the cow be eating at that time, or ruminating, that rumination ceases and the animal bloats. There may be some colic symptoms; this is evidenced by kicking at the belly wall, perhaps attempting to lie down; but those symptoms soon pass away. If you examine that animal again, however, sometimes, or in occasional cases, you may find within a few days that there is a large hematoma which has resulted from the hemorrhage. Again you will find that the cavity or the crevice that is produced by the expulsion of the corpus luteum will sometimes fill up with blood, and this blood will clot and become organized and undergo certain changes; and if you examine that case again you may think there is a yellow body at that position, but that is really the clot of blood, and it will soon undergo organization and be reabsorbed.

I do not know of any more satisfactory cases that can be handled than those that are not coming in estrum due to the retention of a corpus luteum. All retained corpora lutea are not responsible for absence of estrum. Some cows will have a retained corpus luteum, and yet they will come in estrum; but those are the unusual cases, the exceptions to the rule.

The vagina is a very strong muscular organ, lined with stratified squamous epithelium, and this heavy epithelium protects the organ against infection, so that we do not find many pathologic conditions in the vagina which cause sterility. You will find granular venereal disease, and this condition is present in most females. We find, as a rule, that is does not produce a serious vaginitis, although occasionally we will see a rather serious vaginitis; but as a rule, on account of this stratified squamous epithelium the organ is really protected against infection.

Frequently we hear men say that they examine the cervix and find it to be indurated; that if is harder than it should be, and tightly closed, and they did not think conception could take place. In the normal structure it should be rather tightly closed; of course it is more tightly closed in case of pregnancy. The cervix in its normal, healthy condition should be a rather pinkish red or reddish color, and the lumen or opening is rather small. The organ feels rather fibrous because it is made up of fibrous tissue. It is about 3 to 4 inches in length. It is composed of about three angular rings and has longitudinal layers of mucous membrane, and these cripts or folds are rather deep. In case of inflammation of the cervix the mucus covers over these crypts, so that if any bacteria be present they are pretty well hidden and they are hard to reach with medication. This organ is a rather spiral shaped canal and rather difficult to dilate.

The body of the uterus in the cow is rather short. The horns of the uterus or the entire organ in a nongravid condition, especially in the young animal, can be put in the palm of the hand. It can be drawn on the floor of the pelvis. If you are examining heifers, in almost every case there is no use to have forceps

attached because the uterus can be readily palpated without the use of forceps. In some cases you can even examine both ovaries with one hand.

The corpus luteum invariably is slightly elevated; that is, a part of it is elevated above the surface of the ovary. As it keeps growing and enlarging, a portion of it protrudes above the ovary. The ovary in which the corpus luteum is located is in almost every instance larger than the other ovary, so that you will have no trouble in determining the presence of the corpus luteum in most instances. However, there will be some cases in which the corpus luteum is rather deeply embedded, there is no elevation on the surface, there is no elevation at all, and the only difference is that this ovary is larger than the other; and upon pressure one can determine, frequently, not always, the presence of the yellow body, although it be rather deeply located.

Sometimes we will find two corpora lutea in the same ovary—not very often, but occasionally. It may be that one of those will be a retained corpus luteum and the other a corpus luteum of pregnancy.

When we are examining these organs we always determine first whether or not there is any possibility of pregnancy and if a corpus luteum be present. If the animal has a history of having been bred four or five times without conception, and you think that she has also passed over this last breeding period, if she is probably thirty days since her last breeding and you find a corpus luteum present, it is usually advisable to let that yellow body alone until sufficient time has passed so that you know there is no chance of that animal being pregnant; so the corpora lutea under those conditions should not be removed.

We should familiarize ourselves with this gland of internal secretion, because it is really a wonderful gland; it has many functions to perform, it hastens involution of a pathologic uterus, and when we have a uterus that involutes or comes back to its normal position rapidly, that sort of an organ presents a condition that bacteria do not find favorable for their growth in multiplication. When that organ is abdominal in position and the walls rather thin, the bacteria find their conditions most favorable. So I think that this little gland has a very close relationship to the development of the fetus in the early stages in its relation to estrum and in its relation to the involution of a diseased uterus. I mean by that that in cases of pyometra where the pus may be syphoned off, then a corpus luteum removed, that organ will come back up to its normal position many times within twenty-four hours, and again, sometimes it may take several days; but it is remarkable what will happen in many of those cases, if they are taken early, in which the uterus is greatly distended, filled with pus, cervix partly dilated. If you just remove the corpus luteum, nothing else being done, that organ will commence to undergo involution, evacuate itself, and within

a few days be almost normal in its position again. This does not mean that the animal has recovered and is ready to breed again, because the epithelium has been destroyed to a certain extent and it takes quite a while for that to become repaired.

This little gland (corpus luteum) as it is removed is about the size of an acorn, and it leaves a rather large opening.

After conception takes place the cervix begins to fill with a sort of mucus. The mucous plug of pregnancy is a very sticky, adhesive-like material, rather difficult to break down. The uterine seal is nothing more than a mucous plug, and this mucus is very adhesive, and when the fingers come in contact with it it sticks to them and gives you a sort of an idea that there is a vacuum there. Sometimes this may be a little misleading in certain cases of cervicitis; the discharge from the cervix becomes rather adhesive, and it may confuse you and make you think it is a mucous plug.

The cervix does not always close tightly after gestation. Sometimes the cow will go through the full period of gestation without a tightly closed cervix, and even there may be some discharge all the way through her period of gestation; but those are exceptions to the rule. The cervix is invariably tightly closed, and this seal is formed in the very early stages, so that in the heifer or the cow that are fifty or sixty days along in gestation the uterine seal is usually rather easily detected.

We have an organ here in which there is a right horn pregnancy. It is in the very early stages, but one can easily tell that this horn is much larger than the nongravid horn, and when one feels of it in the rectal palpations it has better tone, and as one presses on it it rebounds or springs back up against the hand quickly. There may be tied-in depressions; these tied-in depressions or places are rather common, as we see here in the early stages of gestation.

On this side we find the corpus luteum of pregnancy, and it is slightly elevated, or part of it extends above the surface, and we find a very small fetus. I suspect, judging from the size of it, it is possibly fifty days or maybe a little longer in gestation.

I feel that one can, as a rule, in most heifers, determine pregnancy in thirty-five or forty days, and sometimes earlier; that is in heifers with their first calf. In cows the changes are not so rapid, but in many cows gestation can be diagnosed safely as early as fifty or sixty days, and sometimes earlier. These changes in case of pregnancy begin in whichever horn the young animal is located; it begins to develop rapidly in size and increase its length, so that as one manipulates it by way of the rectum, he will find that the gravid horn is much larger in caliber and is more elongated, and then you will find on that side the presence of the corpus luteum.

If there are any questions about the corpus luteum, I would like to have you bring them up at this time.

CHAIRMAN KINGMAN: Is the color of the true and false corpus luteum the same?

DR. BOYD: I think they are about the same in color. As I said before, it is mainly carotin. These cells are just large epithelium cells. Histologically they resemble very much the cells in the adrenal gland.

I don't believe the oviducts can be palpated unless they are diseased. Perhaps they can occasionally, but as a rule the oviducts are very small and they are difficult of palpation unless they be diseased; but as a rule the corpus luteum can be rather easily palpated.

The mucous membrane or mucous lining of the uterus is entirely different from tnat of the vagina. The mucous glands are rather large in number. We have those large lymphoid bodies in the submucosa and lining of the uterus; in one of the specimens it is destroyed; the epithelium is changed. If these changes be extensive, it means frequently that the animal is permanently sterile, and a good many times temporarily sterile, that condition lasting over a period of months.

If you are examining large numbers of these animals, you will often say to yourself, "I believe that cervix is too tightly closed, and I don't understand it; I believe we ought to dilate it." But I think as a rule there are very few cases of that sort, where the narrowness or the tightness of the canal is due to just the anatomical formation without any signs of disease.

QUESTION: Do you think it wise to suppress the corpus luteum in case of pyometra?

DR. BOYD: I have seen cases where I thought it would be unwise, but in most of them I believe it is wise to suppress the corpus luteum. Some contend that it sets up salpingitis. On the other hand, the involution of the uterus sometimes does not take place if we just depend on syphoning off the contents and then using perhaps some mild antiseptic. I believe in pyometra, as a rule, the infection is not so serious and the organisms are not so virulent, so that in most instances I believe the corpus luteum can be safely removed, and when it is removed, evacuation takes place more rapidly and the organ undergoes involution more rapidly. You may syphon off the contents and find that animal in heat even the next day, but again that organ may refill. I have seen them where the contents were syphoned off and the organ refilled in just a few days, and kept doing that over and over.

QUESTION: What per cent have mummified?

DR. BOYD: I don't know. Sometimes in case of mummification of the fetus the fetus is so large that we have trouble in enucleating or removing the corpus luteum, and again upon removal of the corpus luteum we have to break down the seal, sometimes injecting the uterus with some oil. Again, if it is not a case of too

long standing, the removal of the corpus luteum alone will cause a mummified fetus to be ejected.

QUESTION: Can you tell us more about fat necrosis?

DR. BOYD: I wish I knew more about fat necrosis. I want to bring it up because sometimes it will confuse you with these normal organs. Fat necrosis is usually in around the pelvis, and then it follows in along the intestines, and frequently we find it up around the kidneys. Fat necrosis is usually sort of an oblong shape, sometimes rather flat, and very hard, and it may be mistaken for something else. I know of cows that are suffering with extensive fat necrosis and yet they are breeding all right. I merely wanted to bring it out in its relation in the examination of these organs.

DR. DEVINE: In regard to removing the corpus luteum, if it is diseased there isn't any one thing that would do as much good as taking it out. If there is an infected corpus luteum which may infect the tube, what good is it to the ovary to leave it there? The diseased corpus luteum should come out, and there is nothing that would help a case of pyometra like taking the corpus luteum out. I would prefer to empty the uterus first and then take the corpus luteum out afterwards.

DR. BOYD: I feel that if it isn't removed, what good is it there, and even if the cow does become diseased on that side, there is still opportunity to breed from the other side.

As Dr. DeVine said, if the contents of the uterus are first drained off, then the organ is easier to handle and you can bring it into position better; but in some of our experimental work we wanted to show just what that corpus luteum was capable of doing, so we didn't do that.

QUESTION: Are there any good results to be obtained from the removal of the corpus luteum in an ordinary case of retained fetal membrane?

DR. BOYD: I had an experimental case of that, and I came to a great deal of grief. It is the only one I have tried. There was a retention of the fetal membranes in this animal, and I thought I would just remove the corpus luteum and see what the results would be. I believe it did loosen the membrane up rather rapidly but there developed a great deal of ovaritis, salpangitis, and massive adhesions of the tube to the abdominal wall.

I want to speak of the experimental animals that we gathered up that had pyometra. Some were short standing cases and some long standing cases. They all had a large uterus which was abdominal in position, from which, if you were making a diagnosis of pregnancy and resorting only to rectum manipulation, you would say there was a good strong chance of that animal being pregnant; but you would find the cervix slightly open, and when the cow was in a standing position there was a discharge of pus; but there was an absence of heat, which would lead one to believe that the animal was pregnant. But

upon the animals lying down you would find pus, sometimes malodorous and sometimes not, and sometimes some mucus with it, usually thick and creamy-like in consistency, and yellowish gray in color. We took those animals and pressed out the corpus luteum in every one that we could, and did nothing further. We just wanted to see what would happen in the way of hastening evacuation and involution. In almost every instance we found within twelve to twenty-four hours that that organ would completely evacuate itself and that it underwent rather hasty involution, came back up into position, and in a few days, instead of pus being discharged, there was rather a glairy-like mucus coming away with some particles of pus mixed with it. It was surprising just how that yellow body would bring those results. If they were long standing cases, many times the corpus luteum did not seem to bring about that same result.

In the treatment of such an animal I believe first in removing the contents before the corpus luteum is pressed out. It makes it easier and I think safer. The organ then is brought in the pelvis, and there it can be rather easily manipulated.

DR. FERGUSON: I would like to ask if you prepare cows for the operation of the removal of the yellow body to bring about estrum, if you consider it necessary to prepare dairy cows.

DR. BOYD: I don't know that it is. Perhaps it might be wise to do it, but in most instances we feel that it can be done without putting that cow through any form of preparation; that the corpus luteum in many instances can be removed by pressure exerted by the way of the rectum. However, if it be done by the way of the vagina, I would believe in preparation there.

DR. FERGUSON: What I had reference to was the sick period afterwards, the colic and the cessation of the milk secretion, etc. I have experienced this trouble in a good many herds where they were on full feed and full milk flow. A cow may be just on the verge of indigestion, overfed, and when the corpus luteum was removed the sickness that resulted afterwards would produce quite a serious case of indigestion, quite alarming to the owner. The last year I have made it a practice to empty out those cows before actually performing the operation, and I believe that we are getting much better results. If the animal is dieted and prepared a little before the operation the after-sickness is much shorter, the after inconvenience, I might put it, is much shorter, the rumination is resumed much sooner, and the animal gets back to normal much sooner.

DR. BOYD: Probably that would lessen the cases. However, it has been my experience that the percentage of those cases is rather small. In one herd where we have kept some records we have found that a very large percentage of these animals showed no difficulty or no inconvenience; there was no interference in the milk flow and no interference in the way of digestion. How-

ever, we get those occasional cases, and sometimes they are rather embarrassing cases to explain, and they do cause the owner more or less worry. I recall one instance where a cow was lactating very heavily on official test work, and the removal of the corpus luteum really seriously interefered with lactation, so the herdsman says he knows of a way to dry a cow up. It may cause a serious condition of that sort; that is, it may cause a falling off in the milk flow. However, in most cases those men are willing, unless the cow be making a big record, to sacrifice that record and get the cow back into breeding again; but that should always be explained to the owner. It should be explained to him that possibly it may interfere with the milk flow, and let him decide upon whether or not he should continue this cow on test, or whether he should take a chance of her milk flow being disturbed, or whether he would rather have this animal come in estrum and breed again. They all want, if possible, to get a calf each year. The higher the breeding efficiency, the better their herd.

QUESTION: Is it known how long after you have suppressed a corpus luteum from a cow before she aborts?

DR. BOYD: In our experience we have had a number of cases wherein purebred females have been bred by a scrub sire, or in some of the beef breeds in particular where they have been bred too young, so that their calves would not be eligible for registration, and the owner wondered if they could not be aborted. Most of these animals were in the early stages of gestation, perhaps under ninety days. The corpus luteum has been removed, and in almost every case (there have been exceptions to this) the abortion would occur in about five days, sometimes three days; but we have found in some instances that the abortion did not occur at all, and we felt that some of those cells were left there and they regenerated, and there was enough secretion left in order to hold that fetus in position.

You will hear people say: "Well, I examined a good many cows for pregnancy, but I never touched the corpus luteum." But if they were trying to abort certain individuals, they would find out they might have a hard job on their hands to remove that corpus luteum, especially if the animal was four months in gestation and they couldn't mainpulate it well. Sometimes it is a hard job to abort an animal by the removal of the corpus luteum, showing it is not going to bounce right out of its position by manipulation. I believe in manipulating them very easily, however, and I think that too many times the pressure exerted on ovaries and perhaps on other of the reproductive organs is too severe. We hear men say: "When I first started on that animal the ovary wasn't so large, but it seems to grow larger every time I manipulate it and becomes more fibrous." I think

that palpation is oftentimes too severe, but the corpus luteum is so embedded in its normal position that one can manipulate it in pregnancy without disturbing the position of the fetus and not be afraid of producing abortion, and he will find that out as he is called to abort these animals that have been bred.

QUESTION: Has any experiment been made in preparing the extracts of these yellow bodies and injecting it into the cattle?

DR. BOYD: Yes. Some work has been done. I believe Dr. Hadley has done some work along that line.

DR. HADLEY: Nothing very much.

DR. BOYD: The corpus luteum has been used in cases where there was an absence of estrum, in which apparently there was no corpus luteum, and it has been said it will bring about estrum. We have tried it out, but our experience has been very slight. We have fed and injected the corpus luteum extract. We have macerated the fresh organ. It is said to bring about estrum in those cases wherein there is no corpus luteum present, but it is not very often that we find a cow that doesn't have a corpus luteum present, and its manual removal is usually followed by estrum within a very short time. The corpus luteum extract I know is being used in some cases wherein there is an absence of estrum, and it may be used in cases of certain pathologic conditions; it is possible that it is. It is said that some of the extracts of the other glands of internal secretion are being used in cases of cystic ovaries.

In examining heifers in case that they be freemartins, as I stated before, the organs are undeveloped. Sometimes a freemartin will be coming in heat, and you will hear occasionally where a freemartin has bred successfully, and if she has she can't be classed as a true freemartin. It is said this is due to the fact that the male organs take the place of the female organs. You will find that the vagina is very small, that the vagina is a blind sac, and on rectal examination you will find two cords that represent embryonal tissue, and then as you go farther you may find one or two ovaries; but you will immediately recognize that there is no formal formed uterus present; so it isn't hard to determine a freemartin by rectal examination. And again, going through these animals you will find those in which the uterus is rudimentary or perhaps one horn of the uterus is missing, and occasionally it is possible to get one of this sort of individuals to breed, but as a rule they are not fertile. I know of one animal in which the left horn of the uterus is missing and she breeds successfully in the right horn. She has a well-developed left ovary, but the left horn is missing.

The malformed organs can be rather easily determined, and as you are going through, taking an inventory of the reproductive organs, you will find those conditions right along. We have a very interesting specimen here; it is one of the few I have

ever seen. It is a good deal like one of the slides that we had. The uterus is practically normal in size. The left ovary is missing. The organ has a loss of muscle tone; the cervix contains some mucus, but the outer part is open. On the right side there is a rather large tumor; it may, as suggested by Dr. Fitch, have originated from a corpus luteum. Possibly it has, but we find this sort of thing causing sterility. Many conditions are causing sterility other than those connected with abortion disease.

I feel that the *Bacterium abortus* Bang is not responsible for many of these cases, but it does pave the way for these other bacteria. It is possible that the *Bacterium abortus* Bang may, in some animals, produce enough changes, but as a rule it does not

QUESTIONS What would be the chance of that cow breeding with that tumor?

DR. BOYD: I would say not very good.

QUESTION: What about removing it and breeding from the other side?

DR. BOYD: That could be removed. I can't tell you how the other ovary looked, but that could be removed through a flank operation. It may be advisable to do that. However, on the other hand, if she had been sterile for quite a while and had not been breeding, and not of a good breeding line, perhaps it would not be advisable to operate. However, that is not so large but that it could be removed by a flank operation.

Remember that the ovary in the cow is rather small, as you have seen in the specimens that have been passed around. However, you may examine a number of animals in which the ovary may be quite large. The ovary might be as large as a walnut and still be normal, that is, still be able to ovulate; so that one can not say that the ovary of the cow in its healthy condition is a certain size or of a certain weight, because it varies so much.

Here we find another case of a well-formed seal, a tightly closed cervix, and an early stage of pregnancy. You can see perhaps the beginning of the formation of the cotyledons. One can palpate the cotyledons in four months' gestation.

Here we find a nongravid uterus, and we find that in the right ovary there is a large corpus luteum present. The left ovary is quite large and contains a cyst. It also has many scars showing that it has been ovulated. Sometimes upon examination of heifers you will find that the ovaries are smooth and suggest that ovulation is not taking place. In a number of those cases perhaps the follicles are not being fully developed and therefore are not being discharged, so there is a condition of a treated follicle not being fully formed.

QUESTION: What would you say of a cyst of that size?

DR. BOYD: It is a rather small cyst. Perhaps it has no significance; again, it might be causing that animal irregularity of estrum, and if it was, it should be broken down. The cow that

shows irregularity of estrum and becomes a nymphomaniac is suffering with cystic degeneration of the ovaries. The cyst may not be large, but these same symptoms can be present though the cysts be very small. Usually they are quite large, and the ovary becomes stretched out into a thin sheet-like structure, and when the cyst is broken down and the organ returns to its normal condition the interstitial tissue and the glandular tissue rapidly regenerate.

QUSTION: How do you handle the cyst?

DR. BOYD: Most of the cysts can be ruptured through the walls of the rectum. Again, they may have to be ruptured by pressure exerted through the walls of the vagina, and again it may be necessary even to trocar them, in case the wall is rather heavy and not readily broken down. Sometimes upon pressure the walls of the ovary do not break right open and you have a sensation that it is just slowly evacuating itself. Many times those will refill, and the ovary will refill sometimes as early as three or four days, and sometimes in seven or eight days it is just as big as it was the first time it was broken down.

I would like to say a few words about the organs of the male. In rectal examination of the male we can determine certain pathologic changes, that is, if they be rather well advanced. However, in many cases we may pass over them. There may be certain cases where pathologic conditions are causing sterility in the male. I would like to discuss those of the testicle, wherein certain changes are causing sterility in the male. I want to say also that the problem of sterility in the male is of considerable importance in the handling of an outbreak of this condition or in the handling of this condition in a large herd. It is a well-known fact that a big reputation of pretty nearly every breeder has all been made from some great sire that he has secured, and he invariably wants to hold on to that sire and get just as many calves as possible, and he keeps using him right up into advanced age. Finally he begins to notice that quite a number of the cows that are being served by this animal are failing to conceive, and he begins to take inventory and find that some of these animals put to a younger sire will conceive, and he finds out that this animal is not successful in breeding any more, probably due to advanced age.

As far as diseased condition of the testicles is concerned, occasionally we find that injury to the testicles has resulted in abscess formation, and though one of them be injured and remain apparently normal in size, frequently this animal is sterile from both organs, and even if one testicle is removed, by castration on one side, this animal will still be sterile. However, if this operation were performed early, possibly this animal would still be fertile; but they will become sterile through injury in that way. Injury to the testicle of the bull is not at all uncommon; injury along the sheath is not all uncommon; and these injuries fre-

quently result in adhesions, and these adhesions are such that they are hard to break down and get good results. They frequently recur, so that many good sires are sterile because of adhesions in that way.

In the Angus breed the sire protrudes a part of the prepuce, and this prepuce sometimes becomes infected. Sometimes the testicles become greatly enlarged, due to *Bacterium abortus*, and present the appearance of tuberculosis lesions and may look very much like tuberculosis. We may find some lesions in the seminal vesicles, perhaps occasionally in the prostate. The prostate glands and the seminal vesicles are rather lobulated in the bovine male and can be enlarged rather rapidly and rather easily palpated. So I say that we should pay attention to sterility in the male as well as in the female, and look the animal over carefully, palpate the testicles, examine the prepuce, the sheath, find out whether or not there are adhesions there, find out whether or not there may have been a broken penis and adhesions have formed as a result of that, together with abscess formation.

I would like to say another word about the corpus luteum after it has been expelled. The corpus luteum, after its expulsion, perhaps may fall down in the region of the bladder or in around the coils of the intestine, and there remain for perhaps three or four months before it is finally absorbed; but it undergoes absorption there. Sometimes it may be surrounded by blood. We have made examination as late as four or five months after it has been removed and still found some evidence of it around in the mesentery or the region of the bladder, where it is undergoing absorption. It takes some time before it finally undergoes absorption.

CHAIRMAN KINGMAN: While Dr. Boyd is arranging the specimens we will call on Dr. Bemis. Dr. Bemis has been doing some work at Ames on the estrous cycle, and he is going to tell you about some of it. After his talk he will demonstrate on the live animal the results of their observations.

DR. H. E. BEMIS: Dr. Kingman has said that I have been doing some work on the estrous cycle. He should have said Dr. Murphey, of the Department of Anatomy, who has really been doing this work. We have been making observations with him, and then carrying it on to a practice bearing which we think it has in doing sterility work. We believe that close attention to details is very essential in coming to proper conclusions in doing sterility work, as in almost any other kind of work.

This is how Dr. Murphey has summarized his observations:

A. Diestrum.—Os circular; vagina comparatively dry; very few epithelial cells; practically no leucocytes.

B. Estrum:
   Proestrum:
   1. Bright cherry red color of vestibule due to congestion of bulbus vestibuli. (Inflammation.)

2. Enlargement of vaginal part of cervix due to swelling or ripening of mucous cells.
3. Beginning of the outpouring of mucus from the cervical canal.
4. Slight swelling of the vulva.

Estrum (or heat):

1. Signs: Bawling; uneasiness; depression of lumbosacral articulation; on digital manipulation of clitoris, receptive movements. (Chronic heat; cystic ovaries.)
2. Swelling of vulva.
3. Vestibule deep red to mahogany.
4. Involuntary contractions of vestibular sphincter.
5. Os uteri, a transverse slit.
6. Great swelling and protrusion into the vagina of the folds of muccus membrane of the cervix. The folding is more marked, and arranged in three to four rows. (Evans says due to evagination of the encircling rows of folds. In old cows mostly two encircling rings, while in virgin heifers mostly one and a half rings.)
7. A marked outpouring of clear, viscid, cohesive mucus.

Postestrum:

1. A sudden cessation of estrum or heat manifestations.
2. A gradual cessation of the anatomical changes. The vulva becomes wrinkled. The deep color of the vestibule remains relatively longer; the enlargement of the cervix gradually subsides; mucus is discharged from the os for two or three days (not pathological). The vaginal mucus is streaked with, or shows white flocculi. (Since this we have found red spots or streaks, erythrocytes, due to red blood cells intact (discharge isotonic) in a part of the cases, probably due to desquamation of the surface epithelium as is known to occur in other species.) Later it becomes gummy, sticky and adhesive; it is opalescent. The white material is both epithelial cells and leucocytes. However, some of the latter are present in smears made directly from the os. Microscopically the cells show increasing degeneration, step by step, with the increasing gumminess of the mucus.

Diestrum:

Estrum: Uterus:

1. Marked congestion. (Not pathologic degeneration.)
2. Edematous, glassy, mucous membrane folded in hillock fashion.
3. Petechiæ on both the cotyledonous and intercotyledonary mucous membrane.

That is merely a brief summary. Probably you will not carry very much with you from this presentation, but get the point that it is important to note carefully the color changes and the character of the mucus and the swelling or protrusion of the cervix during the various periods of estrum, and learn for yourselves the things which are normal processes in order that we may not mistake them for abnormal.

I shall not be able to show you these various conditions, because I have not been able to get cows which are in the various stages; but I do want to show you something which I think is of a great deal of value in making examinations of the vagina

and cervix, and that is the use of this glass speculum, which was thought of by Dr. Murphey, in making these observations where he wanted normal colors with the least irritation possible.

This is merely a glass tube an inch and a half in diameter. This one is 18 inches long. It may be from 15 to 18 inches long, and should be perfectly smooth on the ends. This speculum can be easily introduced into animals of almost any size. I have a small speculum for very small animals, and larger speculums can be used on larger animals; but this is the average size, and can be used on practically any animal.

Those of you who have been doing sterility work know that in the small animals and young animals there is perhaps not much to do on the vagina; still our examination is not complete without an examination of the vagina and cervix. There is difficulty in entering the vagina in any other way, and by the use of this speculum you can get a view of the mucous membrane, the position of the cervix, its condition, and complete your examination very satisfactorily and with very little trouble. It has become a regular part of our equipment and a regular part of our routine in making sterility examinations.

I am going to put an animal in the stocks here and introduce this speculum, and then with the use of a flashlight you will be able to see the color of the mucous membrane and the position of the cervix and something of the size of the cervix in its normal position, which I think is something of value to those who have not been doing this work.

(*Proceedings to be continued.*)

L. M. ESTABROOK SIGNS ARGENTINE CONTRACT

Leon M. Estabrook, associate chief of the Bureau of Agricultural Economics, will reorganize and develop the livestock reporting and statistical work of the Argentine Government. He plans to sail from New York with his family January 3 for Buenos Aires, where he will make his headquarters.

The selection of Mr. Estabrook was the result of a cablegram from the present minister of agriculture, Tomas A. Le Breton, who was formerly Argentine ambassador at Washington. While in Washington, Senor Le Breton took a special interest in the organization of agricultural agencies such as the United States Department of Agriculture and the State experiment stations. It was his knowledge of the efficiency of the crop and livestock reporting services in this country that resulted in his request that a man of national reputation in this work be selected to develop similar methods in Argentina.

OTHER MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was held in the New York Academy of Medicine, 17 West 43d Street, Wednesday, October 4, at 8.30 p. m., President MacKellar presiding.

The minutes of the June meeting were read and approved.

Dr. Adolph Eichhorn, Pearl River, N. Y., gave an interesting and highly appreciated talk on his experience in Europe along veterinary lines. The doctor spent three busy months visiting the principal countries of Europe, and as he had a commission from the United States Government to investigate conditions, he got an entrée and could delve into the facts that would be impossible to the ordinary tourist or traveler. He visited veterinary colleges, laboratories, boarding establishments and abattoirs, and got a broad outline of conditions in the various countries. He said the veterinary schools have large enrollments but the schools have not made any progress since prewar times, due to lack of revenue and scarcity of experimental animals and material for demonstration, especially so in German, Austrian and Hungarian schools. Sanitary medicine is being given much attention, and the prospects for the veterinary profession are bright for the future. Contagious pleuropneumonia is very prevalent in continental Europe at the present time. For diagnosis they are using the complement-fixation test. With regard to contagious abortion the same conditions prevail as in the United States. They are using various methods of control. The injection of live cultures is adopted in all of the European countries. Dr. Eichhorn stated that livestock conditions in general are still far from the prewar standard, especially in the defeated countries. In the cities of Germany and Austria there are very few draft horses seen on the streets. Russian ponies and oxen take their places. In France, on the other hand, he said the horses and cattle were splendid. The doctor answered a number of questions satisfactorily.

Drs. Way, DeVine and MacKellar, who had journeyed to St. Louis, gave admirable reports on the A. V. M. A. convention.

They reported the meeting as well attended, the literary program of high character, and they said the clinics were the most outstanding feature of the convention. These covered two days. Those for large animals were held at the National Stockyards, while veterinarians interested in small-animal practice were entertained by a series of operations on dogs and cats at the Planters Hotel. The delegates were unanimously agreed that it was distinctly a practitioners' meeting.

Drs. Gannett, DeVine and MacKellar gave a review of the New York State Veterinary Medical Convention, held at the State Armory, Syracuse, July 26-28. They reported that the meeting was well attended and the literary program diversified and of a high order of merit, with an excellent clinic.

Under case reports Dr. MacKellar said he lately had a peculiar case in an aged gray gelding. History: Horse refused food for 24 hours before the doctor was called to examine him. Owner said he had a disagreeable odor from nose and had difficulty in getting up. Symptoms: Temperature 105, wiry pulse, increased resonance of lungs, bowels and kidneys acting freely, trembling of shoulder muscles, no apparent pain. Diagnosis: Probably internal rupture; "blind case." Horse died during the night.

Dr. I. E. Altman reported the case of a Chow dog which urinated from the scrotum. Passed a catheter through opening and made a diagnosis of calculus. Dog died during the night. On postmortem found a fistulous tract from urethra at pelvic arch to scrotum with two calculi lodged in urethra.

Dr. H. K. Miller reported an Irish terrier puppy 3 months old with a blind bile duct connecting with the umbilicus.

Dr. E. B. Ackerman said he was called to examine a dog for a hemorrhage from the penis. On examination he found a rubber band around the glans penis. He removed the band and the dog recovered. J. ELLIOTT CRAWFORD, *Secretary.*

BRITISH COLUMBIA VETERINARY ASSOCIATION

The annual general meeting of the B. C. Veterinary Association was held in the O'Brien Hall, Vancouver, B. C., on October 6, 1922.

The President, Dr. A. J. Damman, was in the Chair.

The minutes of the last annual general meeting and the special general meeting were reported as read.

The Secretary reported that Dr. F. Torrance, Veterinary Director General, would soon be in the city and that he would be pleased to meet the practitioners. The President appointed Drs. Alton and Chester to arrange the time and place of the meeting with Dr. W. Mackenzie.

A resolution was then introduced by Dr. W. Thomson of Keremeos and seconded by Dr. Strong and after discussion unanimously carried, that this association recommend to the conferring committee of the University of Toronto, that they confer the honorary degree of Doctor of Veterinary Science on the Hon. Dr. S. F. Tolmie, our past president and ex-Minister of Agriculture, in recognition of his work as Minister of Agriculture, his excellent efforts in endeavoring to have the British cattle embargo removed, and his securing of the admission that the embargo was no longer justifiable on account of disease of Canadian cattle, which absence of disease is due to the excellent work of the veterinary profession in Canada; also for his work in cleaning up the disease of mange in Alberta and Saskatchewan, that resulted in the removal of the blanket quarantine and so facilitated the movement of livestock; also of his foresightedness in calling and arranging the Ottawa Veterinary Conference, and his general attitude in always advancing and seeking recognition of the veterinary profession in Canada, as evidenced by his public speeches and his speeches in the House of Commons.

The Secretary-Treasurer then read the financial statement and the President appointed Dr. W. McKay and Dr. R. T. Hoggan as auditors. These later reported the accounts correct, and kindly remarks were made of the Secretary's work during the past year.

The President then made his annual address, outlining the activities of the association during the past year. He thought the Council had done good work in furthering the aims of the association and profession, and in seeking greater recognition, of which he thought we were not receiving our due amount, and he hoped next year's Council would also have good support from the members to carry on the good work.

Under new business Dr. Strong brought up the subject of sanitary inspectors, and said that he thought some of them were doing veterinary sanitary work. He suggested our affiliation with the Sanitary Institute, and said that he thought the veterinary association should be the body to decide the qualification of any person attempting to undertake any class of sanitary work

that had to do with livestock, or with food for human consumption.

Discussion followed and the subject was referred to the incoming Council.

Dr. K. Chester as the association's delegate to the Ottawa conference explained the objections to the proposed Canada Veterinary Act, which objections had been concurred in by the association at the special general meeting held last December, and a letter was read from Dr. W. Thomson on the subject. It was moved by Dr. Strong and seconded by Dr. W. Alton and carried that this association again ratify the action of its delegate at the conference. The meeting was in favor of a real Canadian Registration Act, that would obviate the necessity of Provincial Examining Boards, to a great extent.

The next item of business was the election of the Council, and the following were nominated, some by written nominations from absent members: Drs. Keown, Alton, Sparrow, Edgett, Hoggan, Howell, Chester, Darby, Swenerton, Ottewell, Damman, Jervis and Findlay.

The President appointed Drs. Strong and Keown as scrutineers. These later reported the following seven elected: Drs. Damman, Chester, Hoggan, Alton, Howell, Sparrow and Ottewell. At a Council meeting held later, the Council elected Dr. Geo. Howell as President, R. T. Hoggan as Vice-President and Dr. K. Chester as Secretary-Treasurer.

Dr. Damman was nominated for President again but declined, as also did Dr. M. Sparrow. Provincial Inspectors Drs. Alton and Sparrow and Dominion Inspector Dr. K. Chester were appointed Examiners, as provided by the Act.

The subject of raising the annual fee from $5.00 to $7.00 was then introduced, to cover the cost of the subscription to *Canadian Veterinary Record*. Speeches were made for and against, but the majority were of the opinion that the $5.00 fee was high enough, and that the members should be free to subscribe or not as they saw fit. There was no adverse criticism of the *Record* at all, but rather the reverse and all expressed a willingness to help as much as possible, which was shown in a practical manner, by ten subscriptions to it being handed to the Secretary immediately after the vote was taken, which also included a written vote from absent members. It was then moved by Dr. Howell and seconded by Dr. Strong and carried that

this association forward the sum of $25.00 to the *Canadian Veterinary Record,* towards the cost of its publication.

This was all the business transacted, no papers being read, in view of the Northwestern meeting that was held last July. A suggestion was made that the next annual meeting be held in the Upper Country, but that rests with the Upper Country members. If they will get together, get busy, choose a place and arrange a program, there is no reason why we should not have another successful meeting as the one held at Penticton some years ago. KENNETH CHESTER, *Secretary.*

CENTRAL NEW YORK VETERINARY ASSOCIATION

The thirteenth semi-annual meeting of the Central New York Veterinary Medical Association met in Syracuse November 8, 1922.

The meeting was opened with a clinic at the infirmary of Dr. J. A. Pendergast, he having just moved into new quarters and had not had much time to prepare for a clinic; consequently the number of cases was smaller than usual.

Case 1. Black gelding; necrotic lower molar, pus extending into the surrounding structures. Surgeons, Dr. J. A. Pendergast and Dr. J. H. Stack.

Case 2. Roan gelding; ulcerated foot. Surgeon, Dr. J. A. Pendergast.

Case 3. Bird dog; goiter; removed by Dr. Clark.

Case 4. Trimming the ears of three pups. This was performed by Dr. McLelon, of Buffalo, in a very scientific manner, and was very interesting.

This closed the clinic and, though short, it was very instructive. Adjournment was taken to the St. Cloud Hotel.

The regular business session was opened at the St. Cloud Hotel at 3 p. m. In the absence of the President and Vice-President, the meeting was called to order by the Secretary, and upon motion Dr. W. L. Clark was elected to act as President pro tem.

Minutes of the last semi-annual meeting were read, approved and ordered placed on file.

At roll call, the following members responded: Drs. Otto Faust, Don A. Boardman, W. L. Clark, J. M. Currie, E. E.

Dooling, J. B. Knapp, Hugh D. Laird, J. A. Pendergast, J. H. Stack, A. J. Tuxill, C. R. Baldwin, F. N. Burk, E. E. Cole, Geo. W. Derrick, W. G. Hollingworth, W. M. Long, Frank Morrow, J. C. Stevens and W. B. Switzer.

Dr. Frost of the State College was present and took an active part in the discussions.

A communication was read in regard to appropriating $150 for 100 copies of the *Southern Tariff Advocate* to be sent to members of the United States Senate for one year.

Moved, seconded and carried that the matter be laid on the table indefinitely.

A communication was then read from the Blue Cross Society in regard to the use of anesthetics in animal surgery.

A motion was made, seconded and carried that a committee of three be appointed by the President, with Dr. Hollingworth chairman of said committee; and that this committee adopt such resolutions for this society as seem in their judgment to be proper and most humane, and to forward said resolutions to the Blue Cross Society.

Dr. Don A. Boardman read a very interesting paper on abortion in cattle. This paper brought out a good discussion, which was opened by Dr. Frost. Many points were brought out which tended to show that cleanliness went a long way toward preventing the disease.

The next paper was by Dr. Clark on Necrobacillosis in Swine. This was also very interesting and brought out many questions and suggestions.

Dr. W. M. Long read a report of a case of pneumonia that he had encountered in his practice. This closed the literary program, but several other subjects came up for discussion in a general way.

Dr. Tuxill asked that the Secretary be requested to write Dr. McAuliff to procure a paper from Dr. Moore that he read at the Southern Tier meeting, and present it at our next meeting.

The following volunteered to furnish papers for the annual meeting in June, 1923: Drs. J. M. Currie, J. H. Stack, Don A. Boardman, W. G. Hollingworth and A. L. Danforth.

W. B. SWITZER, *Secretary.*

B. A. I. VETERINARY INSPECTORS' ASSOCIATIONS OF CHICAGO AND ILLINOIS

A meeting of the Illinois State and the Chicago Local Association of B. A. I. Veterinarians was called to order by the president, Dr. W. H. Daly, in the Government office at the Morris & Company plant, Monday, November 11, 1922, at 9 a. m. This was the first of a series of meetings, commencing on Monday morning, to be devoted to the discussion of subjects to promote the professional interest and efficiency of the B. A. I. veterinarians.

The principal speaker of the morning was Dr. A. A. Swaim, who spoke as follows on organization and the many advantages obtained by organization:

The tendency of the present day in nearly all avenues of life is toward organization instead of individual effort. This in a large measure is the result of existing conditions, and a close analysis reveals the fact that people are moving along the lines of least resistance to obtain certain objectives.

Individual effort must accomplish certain things. However, there are limitations, and it is beyond these boundaries that organization or association becomes invaluable. Efficiency in the individual or the organization must always be a prime factor in the success of the individual or the successfully conducted association. Every individual or organization must appreciate the value of three things, viz. to learn, to think, and to do.

A study of psychology reveals the action or behavior of the individual in connection with and in contrast to groups or organizations of people. Business and business schools have adopted many principles of psychology simply because the human element is the prime factor to be considered.

The present tendency of business is to drift away from individual ownership and toward corporation or organization as better results are obtained. Here is one single idea to explain: Organization has learned the value of the word "please," and every year $8,000,000 is spent in inserting that one word in telegrams only.

Treating the subject in a broad sense, we may say that efficiency, organization and association are the words which compose the synthetic syllabus of correlation preparatory to concentrated action upon a definite objective or action. One eminent man describes efficiency as "maximum results with minimum action," and organization as "a number of individuals in one group or combination actuated or guided by a definite purpose or principle."

There are certain fundamental principles which determine the success or failure of an organization, namely: (1) Proper organization;

(2) loyalty; (3) efficient methods; (4) a definite objective; (5) spirit—spirit of success.

Proper Organization.—By proper organization two subjects of material interest—reclassification and retirement—have been brought to the attention of the public.

Loyalty.—Loyalty to professional standards has placed veterinary inspectors in the scientific class in proposed legislation. Loyalty to our association will make it an efficient force. Any division of our association at this time would be fraught with serious consequences, as a united body is the only hope of success. In fact loyalty is the keynote of success. It is reported that there is an attempt by one of the eastern members to change the name of our association by the formation of "club." Any division within our ranks with so many vital issues at stake must result in decreasing our power, prestige and usefulness.

Efficient Methods.—Efficient methods must be employed to carry out one of the prime objects of our association—"to promote professional efficiency."

A Definite Objective.—A study of the objects of this association stamps it as worthy of existence and your cordial support.

Spirit.—Spirit of Success.—The value of an organization is measured by its service. The spirit of this association is service and to cooperate with the Bureau.

Organization is effective in industry, to the profession, in agriculture, and in social life, as shown by the countless numbers of associations formed in every avenue. They accomplish results where the individual unit ceases to be effective. Select any of the organizations in any group, and it will be seen that those which comply with the above fundamental principles are successful.

A study of a few organizations in the industrial group—Standard Oil, United States Steel Corporation, Ford Motor Company—is convincing proof of the value of proper organization. Why are they successful? Because they comply with the requirements of successful organization. One other reason: There is a master guiding hand behind each, which it is needless to name.

It has been my privilege to be associated for a number of years with a large branch organization of the Bureau of Animal Industry. By complying with five fundamental principles, and with training and experience the inspector in charge has perfected an organization consisting of a staff of co-workers endowed with and trained in the principles of loyalty and efficiency, with the result that the work of the station, though large and complex, stands second to none. The same facts hold good in any line of endeavor, whether the unit of operations be great or small.

In conclusion, allow me to say that I should prove recreant to my trust as a friend and co-worker of such a highly intellectual body of men if I failed to direct your thoughts to the many advantages to be gained and the benefits derived from an efficient organization and

helpful association as represented by the Chicago branch of the National Association of Bureau of Animal Industry Veterinarians.

Let us show our efficiency by adopting progressive methods of organization to secure and to maintain a proper professional standard. This can be attained only by the earnest efforts of a well-organized body of men striving together loyally for a common cause and not through individual efforts alone.

It is said a chain is only as strong as its weakest link. May each member of this association forge each individual link so securely in our whole chain that we shall present a united front on every question of importance which arises. "In union there is strength." However, there is one word which I wish to impress upon your memory in an indelible manner. That word is "loyalty." It is the belief within us which conquers seemingly insurmountable barriers and stamps the word "success" upon our efforts. With a loyal association, performing our duties in a highly efficient manner, and fully cooperating with the wishes of the Bureau, we have a meat-inspection force so valuable that anyone may feel justly proud of his membership in such an organization.

Dr. J. Hannon gave a complete thesis on lobar pneumonia.

A number of pathological specimens were presented and discussed by Drs. L. Enos Day and W. N. Neil.

H. L. HOPKINS, *Secretary.*

UNITED STATES LIVESTOCK SANITARY ASSOCIATION

The twenty-sixth annual meeting of the United States Livestock Sanitary Association was held in the LaSalle Hotel, Chicago, December 6, 7 and 8.

The meeting was called to order by the President, Dr. T. E. Munce, of Pennsylvania, who expressed the regrets of the Association that the Hon. Henry C. Wallace, Secretary of the United States Department of Agriculture, was unable to be present to deliver the opening address. Dr. Munce proceeded immediately to deliver his address, which was an important feature of the program, especially on account of the constructive recommendations by one who has given much study to the aims and policies of scientific organizations and who has the future welfare of the United States Livestock Sanitary Association deeply at heart.

The members of the Program Committee are deserving of much praise for the excellent, well-balanced program which they arranged. It was necessary to pass two important num-

bers on account of the absence of Dr. E. C. Schroeder and Dr. A. Eichhorn. Dr. Schroeder was unable to attend the meeting on account of the death of his mother, and Dr. Eichhorn was detained at home to care for his wife who was injured in an automobile accident. All the addresses were of unusual merit.

The reports indicated that the members of the various committees gave careful study to their subjects and much care in the preparation of their material. These reports contain much information and many suggestions of interest to veterinarians who have not yet joined the Association as well as the members. For instance, the Committee on Tuberculosis recommended in its report that 15 per cent of the Federal appropriation for indemnifying owners for reactors be used to pay for cattle tested and condemned by accredited veterinarians.

In connection with the proceedings, the Chicago Live Stock Exchange gave a banquet on Thursday evening, December 7, at the Chicago Athletic Club, at which tuberculosis eradication was discussed. The livestock exchanges, the Institute of American Meat Packers, State regulatory authorities, farm bureaus, breeders and the Bureau of Animal Industry were represented at this banquet. The reports on the progress of the work in the various States were very encouraging. The spirit displayed by all concerned indicates that livestock owners desire the elimination of the disease from their herds as soon as possible, and future progress will depend upon the action of State legislatures and the National Congress in providing funds to carry on the work.

The weather was favorable for the meeting. It is estimated that 500 veterinarians and others were present. Notwithstanding the many attractions at the international livestock show, all of the sessions were well attended. "We are having a fine meeting," was a salutation frequently heard when old friends met in the lobby of the hotel, and it expresses the universal opinion of those who were present.

Dr. W. J. Butler, State Veterinarian of Montana, was elected President for the ensuing year; Dr. J. G. Ferneyhough, Richmond, Va.; Dr. J. H. Mercer, Topeka, Kans.; Dr. Benj. T. Davis, Cheyenne, Wyo.; Dr. A. W. Miller, Washington, D. C.; and Dr. W. K. Lewis, Columbia, S. C., were selected as Vice-Presidents, and Dr. O. E. Dyson succeeded himself as Secretary-Treasurer.

COLORADO VETERINARY MEDICAL ASSOCIATION

The next meeting of the Colorado Veterinary Medical Association will be held at the rooms of the Gentlemen's Riding and Driving Club, 1525 Curtis Street, Denver, Colorado, on Wednesday and Thursday, January 17 and 18, 1923.

I. E. NEWSOM, *Secretary.*

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION

The fortieth annual meeting of the Pennsylvania State Veterinary Medical Association will be held in Cameron Hall, Second and Walnut Streets, Harrisburg, Pennsylvania, January 23-24, 1923.

The Pennsylvania State Veterinary Medical Association is a member of the Allied Agricultural Associations of the Keystone State and its meetings are held in conjunction with the other agricultural organizations during Agricultural Week. This practice brings the practitioners into intimate contact with the livestock owners of the State, and has proven of great value in placing the relationship between the veterinary profession and the livestock industry on its proper basis.

This year's program has been arranged to include subjects of interest to all practitioners, whether they are especially interested in equine, bovine, porcine or small-animal practice, including poultry practice. Good, practical papers, presented by practitioners, are included in the program and good, live discussions are assured.

All veterinarians are invited to attend the Pennsylvania meeting and a special invitation is extended to all practitioners of the State, whether they are members of the association or not.

R. M. STALEY, *Secretary.*

FLORIDA STATE VETERINARY MEDICAL ASSOCIATION

The Florida State Veterinary Medical Association held a meeting in Jacksonville at the Aragon Hotel on November 22. The most important business coming up before the association was a discussion of a veterinary practice act for this State. Such an act was tentatively drawn up by a committee ap-

pointed for this purpose, and it is hoped that the next legislature will enact a law regulating the practice of veterinary medicine in the State of Florida. The following officers were elected for the ensuing year: Dr. T. J. Mahaffy, Jacksonville, President; Dr. J. V. Knapp, of Tallahasee, Vice-President; Dr. A. L. Shealy of Gainesville, Secretary-Treasurer. The next meeting will be held in Palatka in March in connection with the State Sanitary Association meeting.

A. L. SHEALY, *Secretary.*

DALLAS-FORT WORTH VETERINARY MEDICAL SOCIETY

The initial meeting of the Dallas-Fort Worth Veterinary Medical Society was held on the evening of October 23. A nucleus for the society was formed by a number of graduate veterinarians who gathered at the offices of the Livestock Sanitary Commission of Texas, Ft. Worth, for the expressed purpose of organizing for the interests of both the veterinary profession and the livestock industry. The meeting was presided over by Dr. Leon G. Cloud, State Veterinarian. Temporary officers were elected, committees appointed and other matters taken up which were essential in perfecting the organization. Several of those present made short talks in which they stressed the importance and need of graduate veterinarians in the vicinity of Dallas and Ft. Worth forming a society. It was the general consensus of opinion that the organization should be one in which veterinarians would be benefited, regardless of whether they were engaged in large or small animal practice, bureau, State or municipal inspection, laboratory work or in the commercial field, and that each member with his specialty could be useful to the society.

On Thursday evening, November 23, following a luncheon at the Oriental Hotel, Dallas, the second meeting was called to order. The first business before the house was a report from the committee on constitution and by-laws. Dr. H. L. Blackburn, chairman of the committee, presented a very complete report. After a thorough and somewhat lengthy discussion of the proposed constitution and by-laws it was voted that the instruments with some few minor changes be adopted. A code of ethics was also read and adopted.

The election of permanent officers was next taken up, which resulted in the election of Dr. Leon G. Cloud, Ft. Worth, President; Dr. A. E. Flowers, Dallas, First Vice-President; Dr. S. G. Bittick, Ft. Worth, Second Vice-President, and Dr. W. R. McCuistion, Ft. Worth, Secretary-Treasurer.

A rising vote of thanks was extended to the entertainment committee, for the splendid luncheon and the arrangement for a place of meeting, and to the committee on constitution and by-laws in respect to their labors.

Thirty-nine veterinarians signed the constitution and several applications for membership will be considered at the next meeting, which will be held the first Thursday in January, at Ft. Worth.

COMMITTEE ON PUBLICITY.

MINNESOTA VETERINARY MEDICAL ASSOCIATION

The next meeting of the Minnesota State Veterinary Medical Association will be held in Minneapolis at the Radisson Hotel, on Wednesday and Thursday, January 10 and 11, 1923. An interesting and instructive program is being prepared, and a large attendance is anticipated.

C. P. FITCH, *Secretary.*

FOREIGN COUNTRIES REQUEST LIVESTOCK PICTURES

A series of 10 pictures showing various kinds of types of livestock recently issued by the United States Department of Agriculture is in demand principally by schools, banks, and livestock officials in the United States, but is also going to foreign countries. Among recent requests for the pictures are those received from Norway and Sweden. The series show beef and dairy cattle, horses, mules, swine, sheep, goats, and poultry. Each picture measures 11 by 15 inches and is suitable for wall use or general display by veterinarians.

The display of such pictures in foreign countries will be of assistance in acquainting persons who may see them with the excellent types of livestock raised in the United States and available for purchase by foreigners. The main purpose of the pictures, however, is to encourage the improvement of livestock in this country by the use of better sires.

COMMUNICATION

ANDREW SMITH MEMORIAL FUND

TO THE EDITOR:—

I am enclosing herewith a statement to date of the Andrew Smith Memorial Fund, of which I am treasurer. I have thought that if you could find space to insert this in one of the issues of the JOURNAL it might result in more subscriptions being received.

We are anxious to get at least $5,000 for this fund and all subscriptions should be forwarded to me here.

If you could do me this favour it would be very much appreciated.

Yours sincerely,

GEORGE HILTON,

Ottawa, Canada.

Receipts.

Nov. 5, 1922—Total subscriptions	$760.55
" " " —Canadian Exchange	22.33
" " " —Interest on bonds	37.12
" " " —Bank interest	4.62
	$824.62

Disbursements.

Nov. 7, 1921—Three Victory Bonds ($100)[1]	$291.72
Jan. 10, 1922—Five Victory Bonds, (one for $100 and four $50 bonds)	299.56
May 1, 1922—One Victory Bond ($100)	100.00
Sept. 19, 1922—One Victory Bond ($50)	51.06
Dr. Merillat's expenses	41.00
Bank balance	41.28
	$824.62

[1] All bonds are paying interest at the rate of 5½ per cent, per annum.

NECROLOGY

Dr. William A. Schaffter, a veterinary inspector in the Bureau of Animal Industry, died suddenly in his room on the morning of October 28 at Elizabeth City, North Carolina.

Dr. Schaffter was born in Wayne County, Ohio, September 27, 1876. He attended the Veterinary Department of the Ohio State University for two years and graduated from the Chicago Veterinary College in 1905. He then engaged in the practice of his profession being associated with Drs. Merillat and Wright, Chicago, Ill. In 1910 he moved to Mansfield, Ohio, where he continued in practice, but in 1918 he was compelled to go to Colorado on account of the ill health of his wife. Mrs. Schaffter died in 1920. In August, 1921, Dr. Schaffter was given an appointment in the bureau and was assigned to hog cholera control work in North Carolina, with headquarters at Elizabeth City. He was a brother of Dr. E. P. Schaffter, inspector in charge of Federal meat inspection at Detroit, Mich.

Mrs. O. E. Troy, wife of Dr. O. E. Troy of Raton, N. Mex., passed away November 13, at the Miners Hospital from peritonitis. Mrs. Troy became the mother of a fine baby boy on November 6, and her condition was believed to be entirely favorable to recovery up to a short time before her passing. The child is reported hearty and well.

Alvina Postel (Troy) was born at Mescoutah, Ill., April 14, 1896, and was brought by her parents in the same year to Albuquerque, N. M. She received her education at the public schools and the high school at Albuquerque, at a girls' seminary in Monticello, Ill., and at a normal school in Chicago, where she specialized in physical culture. Later she engaged in physical training work for four years in schools at Dallas and Port Arthur, Texas. She was united in marriage to Dr. O. E. Troy of Raton in January, 1922, the honeymoon being spent in an extended tour of the Hawaiian Islands. Since returning their residence has been in Raton and upon the Troy ranch southeast of the city.

Besides the husband and the little one, Mrs. Troy leaves surviving her her parents, Mr. and Mrs. Andrew C. Postel of Albuquerque, and one sister, Miss Paula Postel, St. Johns, Mo.

The sad circumstances of Mrs. Troy's passing have aroused deep sympathy for the bereaved husband from his many friends.

MISCELLANEOUS

CHRISTMAS IN THE STABLE

By T. P. White, *Washington, D. C.*

On Christmas night when the bells delight,
  And good will to man beseech,
As years are old the legend is told
  That the quadrupeds have speech.
At twelve o'clock by the crow of the cock,
  In the stables o'er the land,
From lips ere dumb there is heard a hum—
  A babble of voices bland.

Said bossy cow, as she made her bow,
  "I am sure you'll not deny,
Though to your ear it may sound quite queer,
  There is none so useful as I.
My muscles make tender, juicy steak,
  And my hide for shoes they tan;
My milk and cream daily flow in stream,
  For the food of babe and man."

Said grunty pig, "I don't care a fig,
  What the rest of you may say,
I am the beast that graces the feast
  On this bright and festive day.
A morsel sweet from my head to feet,
  I create new appetite;
My tender flesh either cured or fresh
  Is my master's chief delight."

And wooly sheep, as he woke from sleep,
  Lent his voice in self praise, too.
Said he, "My breed is a pride, indeed,
  Wether, lamb, or buck or ewe.
'Tis positive that threefold I give,
  In leather, in clothes, in meat.
So I contend I am man's best friend,
  'Tis a fact they oft repeat."

Then spoke old bay, with a gentle neigh,
As he shook his halter rope,
"You've all made claim to some valued fame,
And you're satisfied, I note.
Now list to me, since our words are free,
While a tale to you I tell,
Then without grudge I will let you judge
As a friend why I excel.

"Here I was born on a summer morn,
And the scent of new-mown hay
Came floating by as I cast an eye
On a wonder world that day.
The seasons flew and I quickly grew
To a sound and prancing steed,
And far and wide o'er the countryside,
Not a match had I in speed.

"A lad as kind as e'er one will find,
'Twas my destiny to serve.
Each slight command of his voice or hand
Tingled through my blood and nerve.
I set the pace for many a race
Through the vale and o'er the hill,
A rapid clip without spur or whip
'Neath a rider's guiding skill.

"He hummed a song, I cantered along,
On an autumn morning fair;
My well-shod feet in rhythmic beat,
My nostrils wide to the frosty air.
A sudden alarm, a tightened arm,
An anxious halt, a listening ear,
And clear and plain it was heard again
A desolate cry of fear.

"A leap, a bound, at that distress sound,
There's a human life at stake.
With a vim and dash I'm off like a flash,
A maddened beast we must overtake.

A whispered cheer as I gallop near,
A gentle urge and a final spurt,
The race is won, and the gallant task done,
And a maiden smiles, unhurt.

"A single glance kindles love's romance,
So the fates do oft foretell.
A courtship gay and a wedding day
Brought the maiden here to dwell.
And since that time when the carols chime,
On this night of cheerfulness,
I, too, rejoice in my humble voice,
In my master's happiness.

"I must take heed of the hour's speed,
So my story's to an end.
Please signify if I qualify
To be man's most faithful friend?"
Thus asked old bay—but there's no gainsay,
For the time of speech was spent;
And from the herd not a sound was heard,
So their silence gave assent.

CONTROL OF SHEEP STOMACH WORM

By G. H. LAMSON, JR.
Zoologist, Storrs Agricultural Experiment Station, Storrs, Conn.

THE experiments in the control of the stomach worms of sheep carried on for the last three years have culminated by finding that nicotine sulphate is an effective vermicide for this parasite. Nicotine for a long time has been found to be efficient when given in the food, as tobacco stalks, stems, leaves, and dust. Tobacco dust has been steeped in water and the decoction made has been found to kill the stomach worms. The tobacco dust, however, varies greatly in respect to the nicotine content, and for this reason a staple standardized solution has been sought. It has been found that nicotine sulphate, commonly sold under the name of "Black Leaf 40," added to water made a solution of uniform strength. This has been found to act more efficiently

than the copper sulphate treatment in the experiments at Storrs.

It was easy to procure, easily made, it was cheap, and did not have the prolonged after-effects that the copper sulphate and some other vermicides showed.

The nicotine sulphate can be used in one of three strengths, namely by adding one teaspoonful of "Black Leaf 40" to a quart of water and giving four ounces of this to an adult sheep, and two ounces to a lamb over three months old; or adding two teaspoonfuls to the quart; or three teaspoonfuls to every quart. One teaspoonful strength is used only for weak animals. Two teaspoonfuls could be used for the average sheep and lambs, while three teaspoonfuls could be given to strong animals. In the instances where three teaspoonfuls have been used, few, if any, worms have been left alive in the stomachs of sheep and lambs. Where two teaspoonfuls to a quart were used, it was found that the efficiency was high. One teaspoonful to a quart was sufficient to kill a very large number of the worms, and prepared the animal to gain strength so that later stronger solutions could be given a month or two thereafter. Treatments cost less than a half-cent a dose.

Animals were drenched in the same manner as with copper sulphate and were kept without food twelve hours previous to drenching. In order to have the dosage most effective, it is well to have them go at least eight hours, after drenching without food or water. The treatment should be repeated every three months to an advantage in the average flock. Dosing the sheep with one ounce of Epsom salts and keeping them confined two days after dosing, then placing them on a new pasture greatly reduced the chance for heavy new infection. Over a thousand sheep have been drenched with nicotine sulphate, and only five weak animals have died from the effects of the drenching. One hundred and sixty-five stomachs have been opened and inspected to determine the efficiency of these tests.—*Bulletin of Immediate Information, Storrs Station.*.

PASTEURIZE CREAMERY BY-PRODUCTS

There has been considerable discussion and publication recently relative to the pasteurization of skim milk, whey and buttermilk returned from creameries to be fed to hogs in the State of Wisconsin. Our readers will be interested in the following state-

ment by Mr. C. P. Norgord, Commissioner of Agriculture, Madison, Wisconsin:

"The Wisconsin Experiment Station investigated the spread of tuberculosis from creameries in Dane County to herds of patrons. They compared the spread of tuberculosis by creameries where milk was separated and the skim milk sent back to different farms with those where the milk was separated on the individual farms. In the creameries that separated, the percentage of tuberculosis was 34.5, while in eight other creameries that did not separate, the percentage was 8.5. It stands to reason that the milk from a highly infected herd containing a heavy seeding of tubercle bacilli is distributed throughout the milk, skim milk and whey coming from all other herds. When the farmers take home their skim milk or whey, therefore, they also take home with them in this product a seeding of tuberculosis germs originating from the infected farm. As a consequence, the hogs and calves drinking the skim milk or whey become infected and often the entire herd of cattle and hogs becomes tuberculous."

The condition prevails in some other States, the same as in Wisconsin and there has been a continuous increase of tuberculosis in swine in these States. Although these States have pasteurization laws, they are observed more in the breach than in the enforcement. Inasmuch as it will take many years to reduce bovine tuberculosis in some States to a degree that will cut down the percentage of swine tuberculosis, it will be highly advisable to see pasteurization practiced as extensively as possible at creameries and other dairy stations from which products are sent back to the farm.

LIME AND PHOSPHORUS ARE VITAL TO DAIRY ANIMALS

Lime and phosphorus, although they are found in relatively small quantities in feeds, have a great deal to do with milk production and building up the body of the unborn calf. If the cow does not have enough of these elements in her ration she will draw on the supply in her body for a time, and heavy producers commonly do this. Therefore, it is a good practice to feed cows well when they are running low in milk yield and when they are dry, so that they may store up these elements as

well as others in their bodies for use when the large demand is made.

The common view is that dry cows need only enough feed for maintenance, but experiments have shown that this is not true. The cow is a milk-manufacturing plant, and, like many factories, she must have a reserve supply of materials to draw on when heavy demands are made. A cow that has been well fed when dry and has stored up this reserve is able to produce more on full feed than a cow that was given only a maintenance ration during that resting period. In this way a cow can utilize her capacity the year round, although she may not be giving milk all the time.

In keeping up the necessary lime and phosphorus supply it is well to keep in mind the fact that certain feeds are richer than others in these elements. The feeds which contain the most lime are the legume hays, which include cowpea, alfalfa, soy bean, the clovers, and some others. Of those mentioned cowpea hay contains the most lime, and the others are named here in the order of their richness in lime. The lime content of hay depends to a great extent on its quality. Leafy alfalfa hay contains more lime than coarse, stemmy hay.

The common dairy feeds that contain the most phosphorus are wheat bran, cottonseed meal, standard wheat middlings, and linseed meal, in the order given. Less common feeds that are high in phosphorus are, in order, sesame-oil cake, rice polish, buckwheat middlings, rice bran, sunflower-seed cake, rapeseed cake, buckwheat bran, and malt sprouts.

No grain or other concentrate contains anywhere near so much lime as the legume hays; and no kind of roughage contains phosphorus in quantities comparable to those found in the concentrates mentioned above. Grass hays, corn silage, and corn products with the possible exception of those made from the germs are low in both lime and phosphorus.

USE AMPLE SUPPLY OF PURE MILK FOR SCHOOL CHILDREN

Now that milk is served in many public schools throughout the country, milk and dairy inspectors should make frequent visits to the schools to see that the product is of good quality when delivered and that it is handled and served to the children in a sanitary manner. Inspectors in those cities where milk is

not served in the schools should advocate the adoption of the plan.

One of the duties of the inspector is to see to it that the milk does not stand for some time before being used. A good plan is to have it delivered just at lunch time, or, if this is not convenient, to see that there are facilities for icing and storing it. By taking samples at frequent intervals a close check can be kept on the methods of handling.

Milk for use at schools should always be put up in bottles to reduce the chances of contamination. Before the bottles are opened the tops should be thoroughly washed. Because glasses and cups may not be kept clean, it is best for the milk to be drunk directly from the bottle. Some dairies use special protective caps on bottles of milk sent to schools.

ARAB HORSE TEST IN ENGLAND

The Arab Horse Society of England recently held its third Arab horse endurance test. Under the conditions of the competition the distance to be covered was sixty miles a day for a period of five days. Nine hours were allowed for a day's journey, a minimum of seven hours being fixed for the first three days. An hour's stoppage during the day was compulsory, this being subdivided into two periods of ten minutes each and one of forty minutes. The weight to be carried was 13 stone (182 pounds), and no stimulant of any kind was permitted. The contest was won by Shahzada in 37 hours and 29 minutes (exclusive of compulsory stops). This horse was the lightest in weight of those entered, while the second horse, Shwaiman, was the heaviest.

BRITISH VETERINARIANS GO TO LAW

British veterinary circles have been stirred by a lawsuit for damages for slander, brought by Sir John McFadyean, Principal of the Royal Veterinary College, London, against J. C. Coleman, a veterinarian of Swindon. The action grew out of criticism at a veterinary association meeting by Mr. Coleman of Sir John's alleged policy of offering tuberculin directly to cattle owners, with the expectation that they would choose their own veterinary practitioners to make the tests. The trial before a judge and jury resulted in a verdict for the defendant.

BRITISH VETERINARIANS HOLD SUCCESSFUL CONVENTION

The fortieth annual meeting of the British National Veterinary Medical Association, which was held at Bath last August, appears to have been an unusually interesting and successful gathering. The membership showed an increase from 1,115 to 1,362 during the preceding year.

Dr. O. Charnock Bradley was succeeded as President by Mr. Henry Sumner. Dr. Bradley's presidential address dealt in vigorous fashion with three problems of great present interest and importance to our British colleagues, "Salaries, Education and Research." Mr. Sumner in advocating further professional advancement said: "It is up to our younger men to take opportunities of training such as will fit them to be confrères of the best men that the medical profession can turn out."

The Mayor of Bath was especially happy in his address of welcome and in his address at the annual dinner. Some of his witty remarks will bear quoting:

"The ordinary medical man can ask his patient what is the matter, but the veterinary surgeon has to ask himself what is the matter with his patient—which is a very different thing. A physican can put his mistakes underground. A veterinary surgeon sometimes lives to eat his own errors.

"Since the Government imported mules into this country, I am told that the insurance premiums upon the lives of veterinary surgeons, and for accidents which may befall them, have considerably increased. A mule is always sure-footed, especially with his hind foot. I am told that every person living who drove a mule team in the late war is drawing a pension, in most cases 80 per cent unfit. The average veterinary surgeon takes all these risks, and he is very badly paid."

A number of the veterinarians in Detroit take an active interest in the transactions of the Detroit Section of the Society of American Bacteriologists. At the September meeting the subject of "Actinomycosis" was presented by Dr. Donald C. Beaver, and at the November meeting Dr. H. Preston Hoskins read a paper entitled, "The Preparation and Standardization of Anti-Hemorrhagic Septicemia Sera."

Dr. R. M. Quigley, of Tyrone, Pa., was recently called to mine-guard duty with the 104th Cavalry, N. G. P.

The marriage is announced of Miss Harriet C. Rutherford, of Willow Grove, Pa., to Dr. Frank E. Lentz, of the Veterinary Faculty, University of Pennsylvania.

Dr. William N. Berg has resigned his position as pathological chemist in the Pathological Division of the B. A. I., and is now engaged in the manufacture of biological products at the Berg Biological Laboratory, Brooklyn.

Dr. Charles V. Noback is enjoying a well-earned vacation in the United States after spending several years as Director of the Laboratorio de Higiene, Bogotá, Colombia, South America. He is at present visiting friends in Minnesota but his temporary address while in this country will be 215 Crotona Parkway, The Bronx, New York City.

A dispatch from Helsingfors, Finland, quotes a Russian soviet publication as announcing that the bolshevist authorities in one of the districts ravaged by famine have shot 117 children "for sanitary and humanitarian reasons," because they were affected with glanders following the consumption of the meat of glandered horses.

The veterinary colleges at Utrecht, Netherlands, and Stockholm, Sweden, both of which were founded in 1821, have celebrated their centenaries. To commemorate the occasion each institution issued a handsomely illustrated booklet containing historical and other information. These schools have made notable contributions to veterinary education.

During a very hot spell a man was riding in his Ford with one foot hanging out over the door. A small boy noticing this shouted after him: "Hey, Mister! Did you lose your other roller skate?"—*Harper's Magazine.*

According to *Everybody's Magazine,* the following sign appears near Stoneham, Mass.: "All treepasters will be persecuted by the bull. Look and leave."